Deploying IP Storage Solutions with the Cisco MDS 9000

In this lab, you will implement IP storage services on the MDS 9000 platform, including both Fibre Channel over IP (FCIP) and Internet SCSI (iSCSI) services.

After completing this lab, you will be able to meet these objectives:

- Perform the initial switch configuration
- Configure Gigabit Ethernet interfaces and implement an FCIP tunnel
- Use the SAN Extension Tuner to tune the performance of an FCIP tunnel
- Configure a high availability FCIP environment using PortChannels
- Configure and zone iSCSI initiators and targets
- Configure iSCSI Server Load Balancing using VRRP
- Use the Microsoft iSCSI driver to verify access to the iSCSI target

Required Resources

These are the resources and equipment required to complete this activity:

- Two MDS 9000 family switches with at least two ISLs between them
- Two Microsoft Windows 2000 servers with dual Fibre Channel interfaces and the Microsoft iSCSI driver
- One Fibre Channel JBOD attached to both switches

Task 1: Initial Switch Configuration

In this task, you will connect directly to your assigned switch through the console and set up and validate the out-of-band management configuration. You will then create VSANs.

Activity Procedure 1: Initial Switch Configuration

Note	You must complete this procedure on both switches in your pod. If you are working alone, you must perform the procedure on both switches. If your lab group is split into teams, Team 1 will manage the MDS 9506, Team 2 will manage the MDS 9216.

Step 1 Access one of the MDS 9000 switches in your pod by clicking one of the green **Console** buttons in the LabGear interface.

- Team 1 will manage the **MDS 9506**.
- Team 2 will manage the **MDS 9216**.

Step 2 Log in with username **admin** and the password **1234qwer**.

Step 3 Erase the existing switch configuration.

```
# write erase
Warning: This command will erase the startup-
configuration.
Do you wish to proceed anyway? (y/n)  [n] y
```

Step 4 Reboot the switch.

```
# reload
This command will reboot the system. (y/n)?  [n] y
```

Step 5 Wait for the switch to reload. When prompted, enter and confirm the admin password 1234qwer (your keystrokes will not be echoed to the screen).

```
---- System Admin Account Setup ----
Enter the password for "admin": 1234qwer
Confirm the password for "admin": 1234qwer
```

Step 6 Read the message displayed on the screen, and then enter **y** to continue.

```
---- Basic System Configuration Dialog ----
This setup utility will guide you through the basic
configuration of the system. Setup configures only
enough connectivity for management of the system.
Please register Cisco MDS 9000 Family devices
promptly with your supplier. Failure to register
may affect response times for initial service
calls. MDS devices must be registered to receive
entitled support services.
Press Enter if you want to skip any dialog. Use
ctrl-c at anytime to skip all remaining dialogs.
```

```
Would you like to enter the basic configuration
dialog (yes/no): y
```

Step 7 Press **Enter** three times to *not* create another login account nor configure SNMP community strings.

```
Create another login account (yes/no) [n]: <Enter>
Configure read-only SNMP community string (yes/no)
[n]: <Enter>
Configure read-write SNMP community string (yes/no)
[n]: <Enter>
```

Step 8 When prompted for the switch name, enter the letter P, followed by your pod number, followed by -MDS9216 or -MDS9506, depending on which switch you are configuring. For example, for pod 19, MDS 9216, enter **P19-MDS9216**.

```
Enter the switch name : PXX-MDSNNNN
```

Step 9 Press **Enter** to continue with the out-of-band management configuration.

```
Continue with Out-of-band (mgmt0) management
configuration? (yes/no) [y]: <Enter>
```

Step 10 When prompted for the IP address, enter **10.0.*X*.3** for the MDS 9216, or **10.0.*X*.5** for the MDS 9506 Director Switch (where *X* = your pod number; Ex: for pod 19, MDS 9216, enter **10.0.19.3**)

```
Mgmt0 IPv4 address : 10.0.X.Y
```

Step 11 When prompted for the netmask, enter **255.255.255.0**.

```
Mgmt0 IPv4 netmask : 255.255.255.0
```

Step 12 Press **Enter** to configure the default gateway, and then enter the IP address **10.0.*X*.254**, where *X* is your pod number.

```
Configure the default gateway? (yes/no) [y]:
<Enter>
IP address of the default gateway : 10.0.X.254
```

Step 13 Press **Enter** three times to *not* configure advanced IP options, to enable the Telnet service, and to *not* enable the SSH service.

```
Configure advanced IP options? (yes/no) [n]:
<Enter>
Enable the telnet service? (yes/no) [y]: <Enter>
Enable the ssh service? (yes/no) [n]: <Enter>
```

Step 14 Enter **y** to configure the NTP server, and then enter the IP address **10.0.0.253** for the NTP server address.

```
Configure the ntp server? (yes/no) [n]: y
NTP server IPv4 address : 10.0.0.253
```

Step 15 Press **Enter** four times to accept the default switch port interface state of "shut"; the default switch port trunk mode of "on"; the default zone policy of "deny"; and the default full zone set distribution of "no."

```
Configure default switchport interface state
(shut/noshut) [shut]: <Enter>
Configure default switchport trunk mode
(on/off/auto) [on]: <Enter>
Configure default zone policy (permit/deny) [deny]:
<Enter>
Enable full zoneset distribution (yes/no) [n]:
<Enter>
```

Step 16 Review the configuration summary and save the configuration as follows:

```
The following configuration will be applied:
switchname P29-MDS9506
interface mgmt0
ip address 10.0.29.5 255.255.255.0
no shutdown
ip default-gateway 10.0.29.254
telnet server enable
no ssh server enable
ntp server 10.0.0.253
system default switchport shutdown
system default switchport trunk mode on
no system default zone default-zone permit
no system default zone distribute full
Would you like to edit the configuration? (yes/no)
[n]: <Enter>
Use this configuration and save it? (yes/no) [y]:
<Enter>
[######################################## ]  100%
```

Step 17 If you are working alone, repeat Steps 1 - 16 for the other switch in your pod.

Activity Verification

Complete these steps on both switches in your pod to verify your results:

Step 1 Log in to the console using the username admin and the password 1234qwer.

Step 2 Ping the TFTP server.

```
# ping 10.0.0.198
PING 10.0.0.198 (10.0.0.198) 56(84) bytes of data.
64 bytes from 10.0.0.198: icmp_seq=1 ttl=127
time=0.466 ms
64 bytes from 10.0.0.198: icmp_seq=2 ttl=127
time=0.407 ms
64 bytes from 10.0.0.198: icmp_seq=3 ttl=127
time=0.383 ms
64 bytes from 10.0.0.198: icmp_seq=4 ttl=127
time=0.369 ms
64 bytes from 10.0.0.198: icmp_seq=5 ttl=127
time=0.440 ms
```

Step 3 Press **Ctrl-C** to stop the **ping** command.

```
--- 10.0.0.198 ping statistics ---
5 packets transmitted, 5 received, 0% packet loss,
time 3998ms
rtt min/avg/max/mdev = 0.369/0.413/0.466/0.035 ms
```

Step 4 Enter the **show version** command and ensure that you are running Cisco MDS SAN-OS Release 3.0(1).

```
# show version
Software
BIOS:      version 1.1.0
loader:    version 1.2(2)
kickstart: version 3.0(1)
system:    version 3.0(1)
```

Activity Procedure 2: Configure VSANs

Step 1 On both switches, configure VSANs 2 and 3 and assign interfaces:

```
# conf t
(conf)# vsan dat
(config-vsan-db)# vsan 2
(config-vsan-db)# vsan 2 interface fc1/port
```

Note *port* = **6** on 9506; **10** on 9216

```
(config-vsan-db)# vsan 3
(config-vsan-db)# vsan 3 interface fc1/port
```

Note *port* = **5** on 9506; **6** on 9216

```
(config-vsan-db)# end
```

Step 2 Verify the results on both switches:

```
9506# show vsan mem
vsan 1 interfaces:
  fc1/1   fc1/2   fc1/3   fc1/4   fc1/7   fc1/8
fc1/9
  fc1/10  fc1/11  fc1/12  fc1/13  fc1/14  fc1/15
fc1/16
vsan 2 interfaces:
  fc1/6
vsan 3 interfaces:
  fc1/5
vsan 4094(isolated_vsan) interfaces:

9216# show vsan mem
vsan 1 interfaces:
  fc1/1   fc1/2   fc1/3   fc1/4   fc1/5   fc1/7
fc1/8

  fc1/9 fc1/11  fc1/12  fc1/13  fc1/14  fc1/15
fc1/16
vsan 2 interfaces:
  fc1/10
vsan 3 interfaces:
  fc1/6
vsan 4094(isolated_vsan) interfaces:
```

Activity Procedure 3: Install Fabric Manager

Step 1 Access a Microsoft Windows 2000 server in your pod by clicking one of the green MSTS links in the LabGear interface:

- Team 1, managing the **MDS 9506**, will use Windows 2000 **Server 1**.
- Team 2, managing the **MDS 9216**, will use Windows 2000 **Server 2**

Step 2 Log in as **administrator** with the password **cisco**.

Step 3 Remove any existing Fabric Manager installations on the server by choosing **Start > Programs > Cisco MDS9000 > Uninstall**

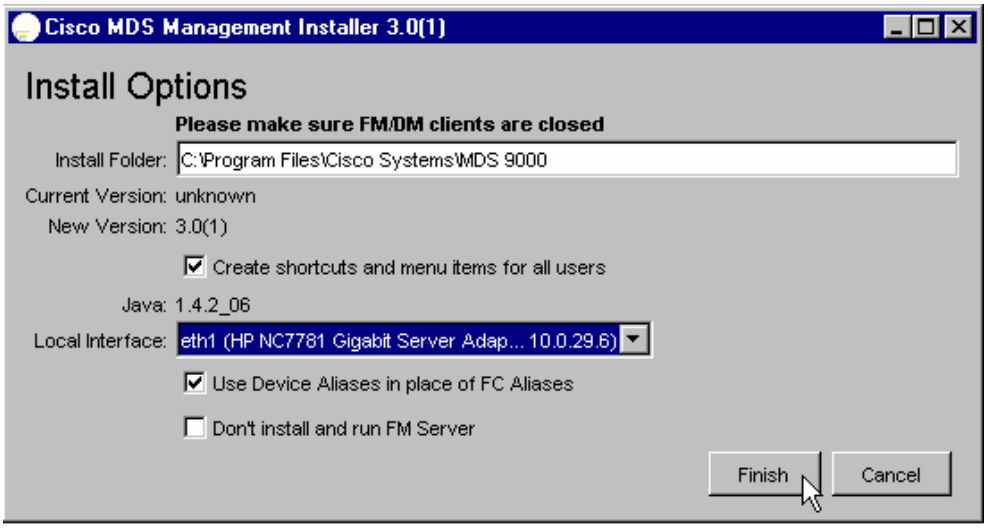
Step 4 To complete the removal, locate and delete the following two folders:

- C:\Documents and Settings\Administrator\.cisco_mds9000
- C:\Program Files\Cisco Systems\MDS 9000

Step 5 Begin a fresh installation of Fabric Manager by opening a web browser and pointing it to the IP address of your switch (**10.0.*X*.5** for MDS 9506 Director Switch and Server 1, or **10.0.*X*.3** for MDS 9216 Fabric Switch and Server 2, where *X* is your pod number).

Step 6 Click the **Cisco Fabric Manager** link on the web page that appears.

Step 7 Choose the interface on the 10.0.*X*.0 network from the Local Interface pull-down menu (do not choose the interface on the 10.1.*X*.0 network). Check the **Use Global Device Aliases in place of FC Aliases** check box.

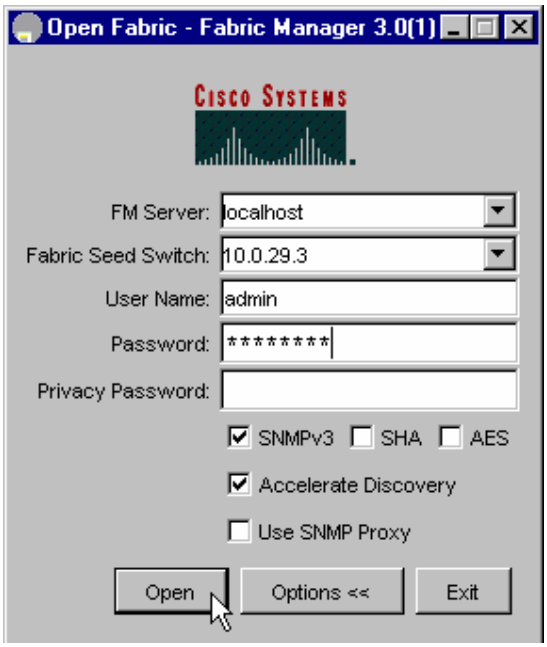


Note	Global devices aliases are preferable because they are not tied to a specific VSAN.

Step 8 Click **Finish**. Wait a few moments for the installation to complete and the Open Fabric dialog to appear.

Step 9 Click **Options** >> to expand the Open Fabric dialog.

Step 10 Verify that the switch IP address is correct in the Fabric Seed Switch field. Enter the password **1234qwer**. Leave the Privacy Password field blank.



Step 11 Click **Open**.

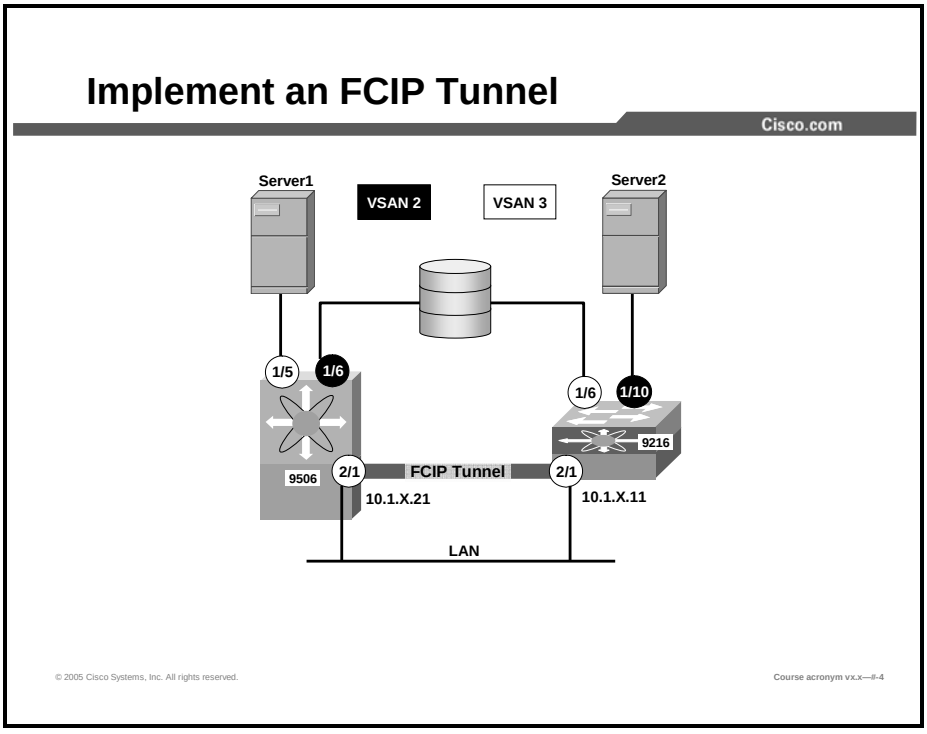
Task 2: Implement an FCIP Tunnel

In this activity, you will configure an FCIP tunnel between the MDS 9000 switches in your lab pod using the IPS module. After completing this exercise, you will be able to meet these objectives:

- Configure Gigabit Ethernet interfaces
- Configure FCIP profiles and interfaces

Visual Objective

The figure illustrates what you will accomplish in this exercise.



Command List

The table describes the commands used in this activity.

Command	Description
show clock	Display the time & date set on the MDS switch
show running	Display the current running-configuration
show fcns database [*vsan* *vsan-id*]	Displays a list of all the ports that are logged in to the FC name server.
show interface fc *slot/port*	Displays the status of and statistics for interface fc *slot/port*.
show interface gigabitethernet *slot/port*	Displays the status of and statistics for interface gigabitethernet *slot/port*.
show interface fcip *interface-number*	Displays the status of and statistics for FCIP interface *interface-number*.
show fcip profile	Display the FCIP profile configuration
show wwn switch	Display the local switch's fabric WWN
vsan database	Enter VSAN database configuration mode
vsan *vsan-id* **[interface fc** *slot/port* **]**	Configure the specified VSAN; add the specified interface to the VSAN.
show vsan membership	Display the VSAN port membership

Activity Procedure 1: Configuring Gigabit Ethernet Interfaces

In this task, you and your teammates will configure Gigabit Ethernet interfaces on your respective MDS switches. Complete these steps on both MDS switches:

Step 1 On your Windows 2000 server, obtain your server's IP address by opening a Command Prompt window (**Start > Programs > Accessories > Command Prompt**) and running the **ipconfig** command. Record the server address in the space provided below.

Record the server IP address: **10.0._____._____**

Note	You will see two IP addresses in the report. Record the **10.0.x.y** subnet address.

Step 2 On your MDS switch console, configure the gigabit Ethernet and iSCSI interfaces using the following command sequence. Verify your results:

```
# conf t
(config)# interface gig2/1
(config-if)# ip address 10.1.x.y  255.255.255.0
```

- MDS9216: **10.1.x.11** (where x = your pod number)
- MDS9506: **10.1.x.21** (where x = your pod number)

```
(config-if)# no shut
(config-if)# end
```

Step 3 Display the status of your Gigabit Ethernet interface. Your output should look similar to the display below.

```
# show interface gig2/1
GigabitEthernet2/1 is up
Hardware is GigabitEthernet, address is
000c.300c.e978
Internet address is 10.1.29.21/24
MTU 1500  bytes
Port mode is IPS
Speed is 1 Gbps
Beacon is turned off
Auto-Negotiation is turned on
5 minutes input rate 8 bits/sec, 1 bytes/sec, 0
frames/sec
5 minutes output rate 136 bits/sec, 17 bytes/sec, 0
frames/sec
45 packets input, 5352 bytes
```

```
  0 multicast frames, 0 compressed
  0 input errors, 0 frame, 0 overrun 0 fifo
338 packets output, 14196 bytes, 0 underruns
  0 output errors, 0 collisions, 0 fifo
  0 carrier errors
```

Note	The interface should be in an up state. If this is not the case, correct the problem before proceeding.

Step 4 To test the Gigabit Ethernet connectivity, ping port **gigE2/1** on the others team's gigabit Ethernet IP address:

```
# ping 10.1.x.y
PING 10.1.21.y (10.1.21.y): 56 data bytes
64 bytes from 10.1.21.y: icmp_seq=0 ttl=255
time=3.6 ms
64 bytes from 10.1.21.y: icmp_seq=1 ttl=255
time=4.2 ms
64 bytes from 10.1.21.y: icmp_seq=2 ttl=255
time=4.2 ms
--- 10.1.21.y ping statistics ---
3 packets transmitted, 3 packets received, 0%
packet loss
round-trip min/avg/max = 3.6/4.0/4.2 ms
```

Activity Procedure 2: Configuring FCIP Profiles and Interfaces

Step 1 Using the CLI, enable the FCIP feature:

```
# conf t
(config)# fcip enable
```

Step 2 Configure the FCIP profile and FCIP interface (tunnel) using the following command sequence:

```
(config)# fcip profile 1
(config-profile)# ip address 10.1.x.y
```

Note mds9216 = **10.1.x.11**; mds9506 = **10.1.x.21** (where x = your pod number)

```
(config-profile)# interface fcip2
(config-if)# use-profile 1
(config-if)# peer-info ipaddr 10.1.x.y
```

Note mds9216 = **10.1.x.21**; mds9506 = **10.1.x.11** (where x = your pod number)

```
(config-if)# no shutdown
(config-if)# end
```

Step 3 Verify your results:

```
# show fcip profile 1
FCIP Profile 1
Internet Address is 10.1.29.21  (interface
GigabitEthernet2/1)
Tunnels Using this Profile: fcip2
Listen Port is 3225
TCP parameters
SACK is enabled
PMTU discovery is enabled, reset timeout is 3600
sec
Keep alive is 60 sec
Minimum retransmission timeout is 200 ms
Maximum number of re-transmissions is 4
Send buffer size is 0 KB
Maximum allowed bandwidth is 1000000 kbps
Minimum available bandwidth is 500000 kbps
Estimated round trip time is 1000 usec
Congestion window monitoring is enabled, burst size
is 50 KB
Auto jitter detection is enabled
```

```
# show interface fcip2
fcip2 is trunking
Hardware is GigabitEthernet
Port WWN is 20:42:00:0d:65:6a:17:c0
Peer port WWN is 20:42:00:0b:fd:d0:68:80
Admin port mode is auto, trunk mode is on
snmp traps are enabled
Port mode is TE
Port vsan is 1
Speed is 1 Gbps
Trunk vsans (admin allowed and active) (1-3)
Trunk vsans (up)                       (1-3)
Trunk vsans (isolated)                 ()
Trunk vsans (initializing)             ()
Using Profile id 1  (interface GigabitEthernet2/1)
Peer Information
Peer Internet address is 10.1.29.11 and port is
3225
Write acceleration mode is configured off
Tape acceleration mode is configured off
Tape Accelerator flow control buffer size is
automatic
Ficon Tape acceleration configured off for all
vsans
IP Compression is disabled
Special Frame is disabled
 . . .
```

Step 4 On both switches, enable the interfaces that is connected to your Windows 2000 server and JBOD using the following command sequence:

```
# conf t
(config)# interface fc1/6, fc1/port
```

Note	*port* = **5** on 9506; **10** on 9216

```
(config-if)# no shut
(config-if)# end
```

Note	The FC host and JBOD in your pod are attached to both switches. To simulate a remote SAN environment, the VSAN assignments require the host access the JBOD solely across the FCIP tunnel.

Step 5 On both switches, display the name server database. You should have similar output as below, with each switch displaying several target entries (JBOD disks) in one VSAN and one initiator (host HBA) in the other VSAN:

```
# show fcns database

VSAN 2:

--------------------------------------------------------------------

FCID        TYPE  PWWN                    (VENDOR)      FC4-
TYPE:FEATURE

--------------------------------------------------------------------

0x0c01dc    NL    22:00:00:0c:50:d1:bb:8a (Seagate)     scsi-
fcp:target

0x0c01e0    NL    22:00:00:0c:50:d1:bc:c4 (Seagate)     scsi-
fcp:target

0x0c01e1    NL    22:00:00:0c:50:d1:bc:58 (Seagate)     scsi-
fcp:target

0x0c01e2    NL    22:00:00:04:cf:6e:2c:9e (Seagate)     scsi-
fcp:target

0x0c01e4    NL    22:00:00:04:cf:6e:60:88 (Seagate)     scsi-
fcp:target

0x0c01e8    NL    22:00:00:04:cf:6e:1d:26 (Seagate)     scsi-
fcp:target

0x400100    N     21:00:00:e0:8b:0f:88:6d (Qlogic)      scsi-
fcp:init

Total number of entries = 7

VSAN 3:

--------------------------------------------------------------------

FCID        TYPE  PWWN                    (VENDOR)      FC4-
TYPE:FEATURE

--------------------------------------------------------------------

0x0d0100    N     21:01:00:e0:8b:3c:9f:d5 (Qlogic)      scsi-
fcp:init
```

```
0xee01dc    NL    21:00:00:0c:50:d1:bb:8a (Seagate)     scsi-
fcp:target

0xee01e0    NL    21:00:00:0c:50:d1:bc:c4 (Seagate)     scsi-
fcp:target

0xee01e1    NL    21:00:00:0c:50:d1:bc:58 (Seagate)     scsi-
fcp:target

0xee01e2    NL    21:00:00:04:cf:6e:2c:9e (Seagate)     scsi-
fcp:target

0xee01e4    NL    21:00:00:04:cf:6e:60:88 (Seagate)     scsi-
fcp:target

0xee01e8    NL    21:00:00:04:cf:6e:1d:26 (Seagate)     scsi-
fcp:target

Total number of entries = 7
```

Task 3: Using the SAN Extension Tuner

In this activity, you will use the SAN Extension Tuner (SET) to generate test workloads on the SAN, observe the resulting performance metrics, and tune TCP parameters to improve performance based on the observed metrics. After completing this exercise, you will be able to meet these objectives:

- Configure SAN Extension Tuner.
- Tune TCP parameters for FCIP performance.

Command List

The commands used in this exercise are described in the table here.

Command	Description
san-ext-tuner enable	Enable the SAN Extension Tuner feature
[no] fcip enable	Enable/disable the FCIP feature
show flogi database	Display all connected device on this switch
show fcns database	Display the name server entries
iscsi enable	Enable the iSCSI feature
show interface	Display interface configuration information
show fcip profile	Display all current FCIP profiles
nwwn 1:00:00:00:00:00:00:00	Create a virtual node WWN using 1:00:00:00:00:00:00:00
nport pWWN 1:00:00:00:00:00:00:01 vsan *vsan-id* **interf gig** *slot/port*	Create a virtual port WWN using 1:00:00:00:00:00:00:01
copy run bootflash:<*file*>	Create a file on bootflash:
data-pattern bootflash:<*file*>	Specify a data pattern file for SAN Extension Tuner
write command-id *id* **target** *pwwn* **transfer-size 1024000 outstanding-ios 2 continuous**	Generate a write command for SAN Extension Tuner
show san-ext-tuner interface gig *slot/port* **nport pwwn 01:00:00:00:00:00:00:01 vsan** *vsan-id* **counters**	Display the counters for the SAN Extension Tuner gigE port
stop command *id*	Stop the specified command id in SAN Extension Tuner
write	Enable write acceleration for an FCIP interface

Activity Procedure

Caution	These steps must be performed concurrently on both switches

Step 1 From the CLI, create VSAN 100 and set the default zone policy to permit on both switches:

```
# conf t
(config)# vsan database
(config-vsan-db)# vsan 100
(config-vsan-db)# exit
(config)# zone default-zone permit vsan 100
```

Note	VSAN 100 will be used to isolate the SAN Extension tuner (SET) virtual initiator and target from physical initiators and targets. Setting the default zone policy to permit, while not a best practice, allows SET virtual initiators and targets to communicate

Step 2 Enable SET and iSCSI on both switches:

```
(config)# san-ext-tuner enable
(config)# iscsi enable
```

Step 3 Enable GigE interface 2/2 on both switches:

```
(config)# interface gigabitethernet 2/2
(config-if)# no shutdown
```

Step 4 Enable the iSCSI interface on both switches:

```
(config-if)# interface iscsi 2/2
(config-if)# no shutdown
(config-if)# end
```

Step 5 Verify that the interfaces are up on both switches:

```
# show interface gig 2/2 brief
--------------------------------------------------------------------------------
Interface               Status     IP Address        Speed      MTU
Port
Channel
--------------------------------------------------------------------------------
GigabitEthernet2/2       up         --                1 Gbps    1500
--

# show interface iscsi 2/2 brief
--------------------------------------------------------------------------------
Interface           Status              Oper Mode           Oper
Speed
(Gbps)
--------------------------------------------------------------------------------
iscsi2/2            up                  ISCSI               1
```

Step 6 Create a file named *test* on bootflash: to use as a data pattern for SAN Extension Tuner:

```
# copy run bootflash:test
```

Step 7 Create a virtual node WWN, port WWN and specify the data pattern file:

```
# san-ext-tuner
(san-ext)# nwwn nwwn
(san-ext)# nport pwwn pwwn vsan 100 interf gig2/2
(san-ext-nport)# data-pattern bootflash:test
```

Note MDS9506: *nwwn* = 01:00:00:00:00:00:00:00 *pwwn* = 01:00:00:00:00:00:00:01
MDS9216: *nwwn* = 02:00:00:00:00:00:00:00 *pwwn* = 02:00:00:00:00:00:00:01

Caution Do not proceed until the previous steps have been performed on both switches.

Step 8 On both switches, generate a continuous series of write commands to the virtual N_Port on the *other* MDS switch:

```
(san-ext-nport)# write command-id 1 target pwwn
transfer-size 1024000 outstanding-ios 2 continuous
```

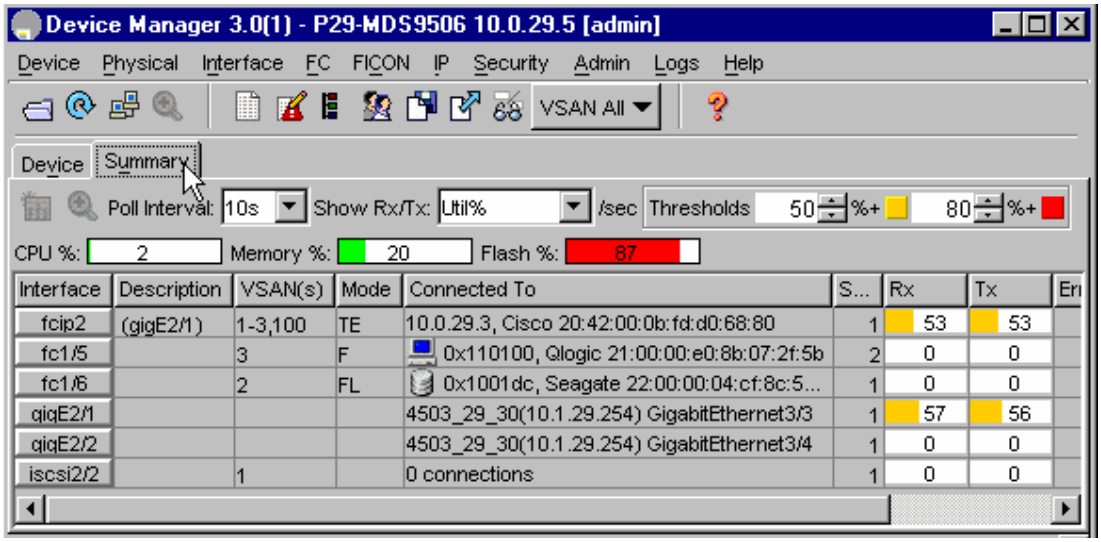
Note MDS9506: target *pwwn* = 02:00:00:00:00:00:00:01
MDS9216: target *pwwn* = 01:00:00:00:00:00:00:01

Step 9 Verify that the virtual N_Ports are present in the FLOGI and FCNS databases:

```
(san-ext-nport)# end
# show flogi database vsan 100
--------------------------------------------------------------------------
------
INTERFACE  VSAN    FCID           PORT NAME               NODE NAME
--------------------------------------------------------------------------
------
iscsi2/2   100   0x640001  01:00:00:00:00:00:00:01
01:00:00:00:00:00:00:00
Total number of flogi = 1.
# show fcns database vsan 100
VSAN 100:
--------------------------------------------------------------------------
-----
FCID        TYPE  PWWN                    (VENDOR)        FC4-
TYPE:FEATURE
--------------------------------------------------------------------------
-----
0x640001    N     01:00:00:00:00:00:00:01                 scsi-fcp
227
0x660001    N     02:00:00:00:00:00:00:01                 scsi-fcp
227
Total number of entries = 2
```

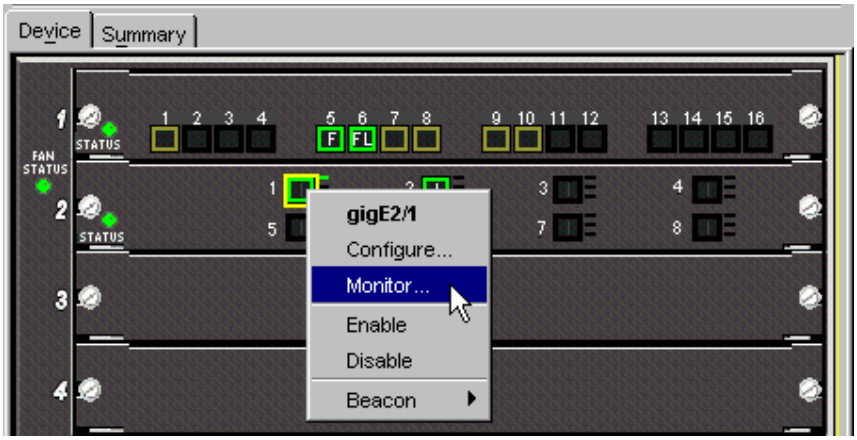
Step 10 On your Windows 2000 host, log in to Device Manager as user **admin** with the password **1234qwer**.

Step 11 Click the **Summary** tab to monitor ISL link utilization.

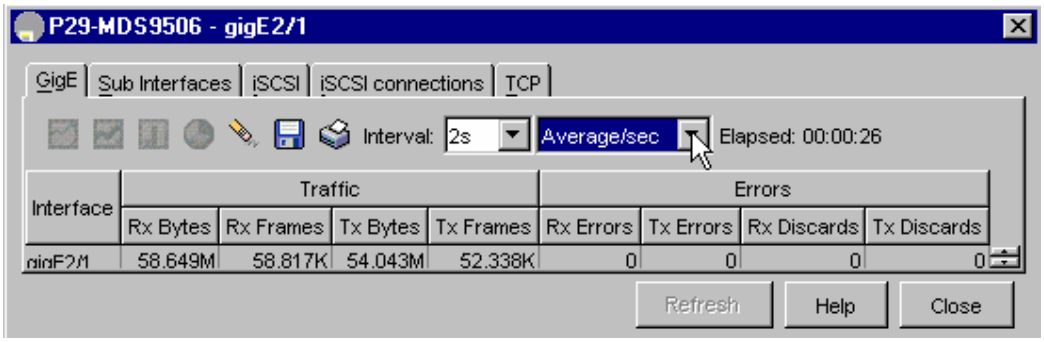


Step 12 Click the **Device** tab.

Step 13 Right-click gigE2/1 and choose **Monitor**.



Step 14 Change the **Interval** to **2** seconds and the **Column Data** to **Average/Sec**:



Step 15 Observe the Traffic data. Verify there is activity. If there is no activity, verify the SAN Extension configuration on both switches

Step 16 From the CLI, display the SAN Extension Tuner counter for gigE2/2:

```
# show san-ext-tuner interf gig2/2 nport pwwn n
vsan 100 counter
```

Note MDS9506 *n* = 01:00:00:00:00:00:00:01
MDS9216 *n* = 02:00:00:00:00:00:00:01

```
Statistics for nport
Node name 01:00:00:00:00:00:00:00 Port name
01:00:00:00:00:00:00:01
I/Os per sec              :  99
Reads                     :  0%
Writes                    :  100%
Egress throughput         : 47.36 MBs/sec (Max -
83.58 MBs/sec)
Ingress throughput        : 52.51 MBs/sec (Max -
55.67 MBs/sec)
Average response time     : Read - 0 us, Write -
36363 us
Minimum response time     : Read - 0 us, Write -
11819 us
Maximum response time     : Read - 0 us, Write -
75500 us
Errors                    : 0
```

Record the **Average response time**: _____

Note You may need to re-invoke the command several times before a non-zero value appears

Step 17 On both switches, enable write-acceleration on the fcip interface:

```
# conf
(config)# interface fcip 2
(config-if)# write-accelerator
```

Caution	Do not proceed until the previous step has been performed on both switches

Step 18 While still in config mode, display the SAN Extension Tuner counter for gigE2/2:

```
(config-if)# do show san-ext-tuner interfac gig2/2
nport pwwn n vsan 100 counter
```

Note	MDS9506 *n* = 01:00:00:00:00:00:00:01 MDS9216 *n* = 02:00:00:00:00:00:00:01

```
Statistics for nport
Node name 01:00:00:00:00:00:00:00 Port name
01:00:00:00:00:00:00:01
I/Os per sec             :  90
Reads                    :  0%
Writes                   :  100%
Egress throughput        : 44.89 MBs/sec (Max -
96.63 MBs/sec)
Ingress throughput       : 44.95 MBs/sec (Max -
58.50 MBs/sec)
Average response time    : Read - 0 us, Write -
35210 us
Minimum response time    : Read - 0 us, Write -
12264 us
Maximum response time    : Read - 0 us, Write -
1629934 us
Errors                   : 10
```

Record the **Average response time**: _____

Note	You may need to re-invoke the command several times before a non-zero value appears. You should see a slight decrease in response time after enabling write acceleration. You may also see errors as enabling write acceleration is disruptive, causing the fcip tunnel to re-establish the link, momentarily preventing traffic.

Step 19 Exit to CLI EXEC mode.

```
(config-if)# end
```

Step 20 Stop the I/O on both switches:

```
# san-ext-tuner
(san-ext)# nport pwwn n vsan 100 interfac gig 2/2
(san-ext-nport)# stop command-id 1
(san-ext-nport)# end
```

Note MDS9506 *n* = 01:00:00:00:00:00:00:01
MDS9216 *n* = 02:00:00:00:00:00:00:01

Activity Verification

You have successfully completed this task when you have:

- Created virtual node and port WWNs on both switches.
- Created a data pattern file on bootflash:
- Verified the virtual N_Ports are present in the FLOGI and FCNS databases.
- Generated write traffic between SAN Extension virtual initiators and targets.
- Deployed Device Manager to monitor ISL link utilization
- Demonstrated how to use the CLI to monitor utilization
- Enabled write acceleration and observed the performance impact

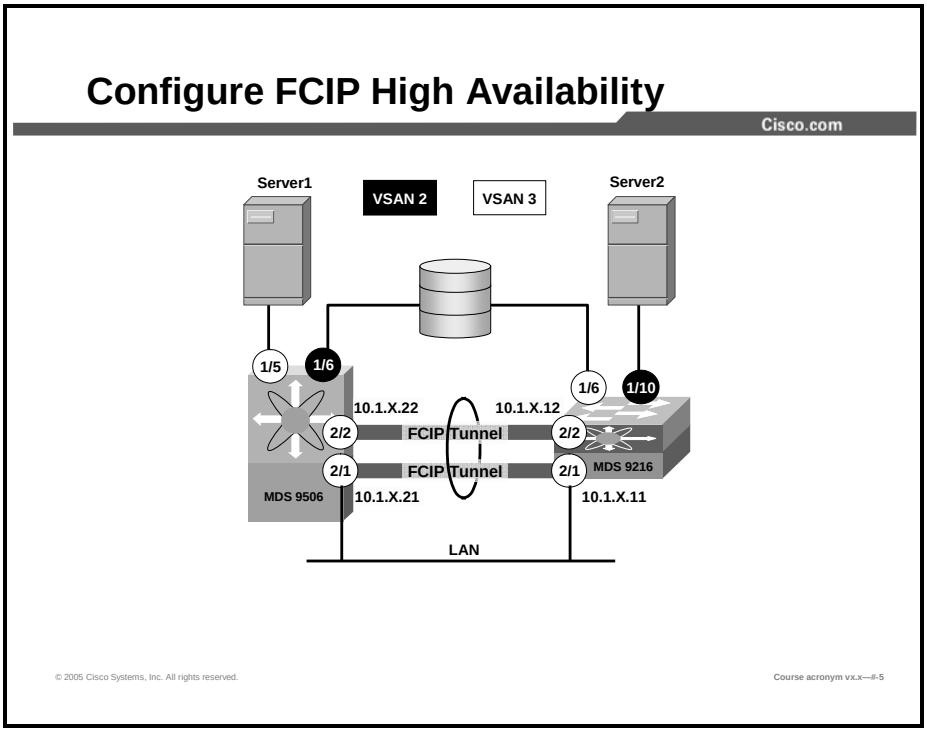
Task 4: Configure FCIP High Availability

In this exercise, you will configure a second FCIP tunnel. Using the PortChannel Wizard, you will then create a Port Channel using the FCIP interfaces. After completing this exercise, you will be able to meet these objectives:

- Implement the FCIP and PortChannel Wizards.
- Configure an FC port channel between the two IPS-modules.

Visual Objective

The figure illustrates what you will accomplish in this activity.



Command List

The commands used in this exercise are described in the table here.

Command	Description
show interface port-channel x	Displays information on the specified PortChannel interface.
show fcip profile	Display all configured FCIP profiles
show fcns database	Display the name server entries

Activity Procedure 1: Configure a Second FCIP Tunnel Using the FCIP Wizard

In this task, Team 2 will use the **FCIP Wizard** from Fabric Manager on Server 2 to configure a second FCIP tunnel. Later, Team 1 will configure a PortChannel using both FCIP interfaces as members.

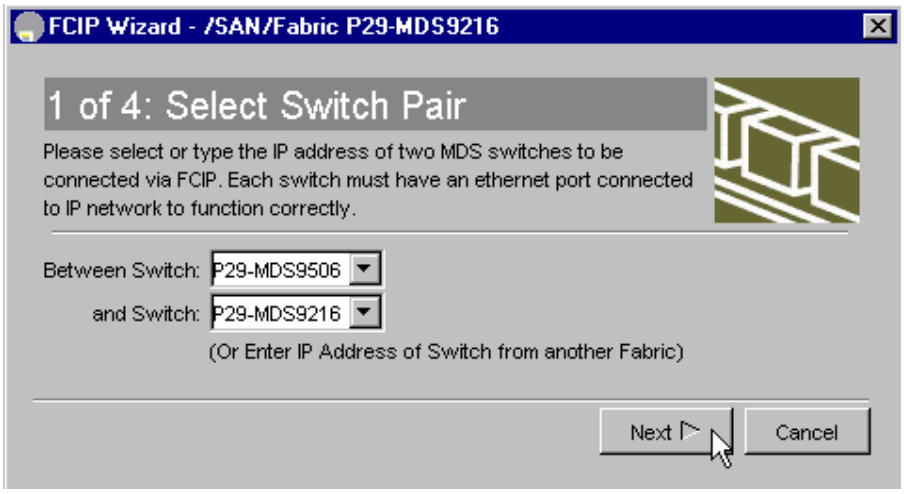
Complete these steps:

Step 1 Launch **Fabric Manager** from the Windows desktop.

Step 2 In the Fabric Manager window, click the **FCIP Tunnel** icon on the tool bar to launch the FCIP Wizard.

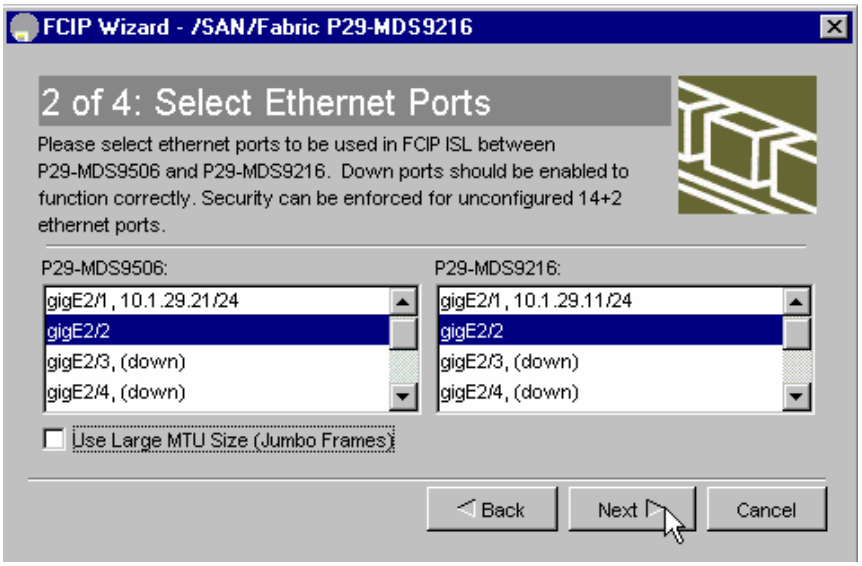
Note	It is not necessary to enable the FCIP feature prior to launching the FCIP Wizard. The wizard can enable FCIP upon completion.

Step 3 In the FCIP Wizard—**1 of 4: Select Switch Pair** screen, verify the **Switch** fields display the switch names of both your pod MDS switches.



Step 4 Click **Next** to continue.

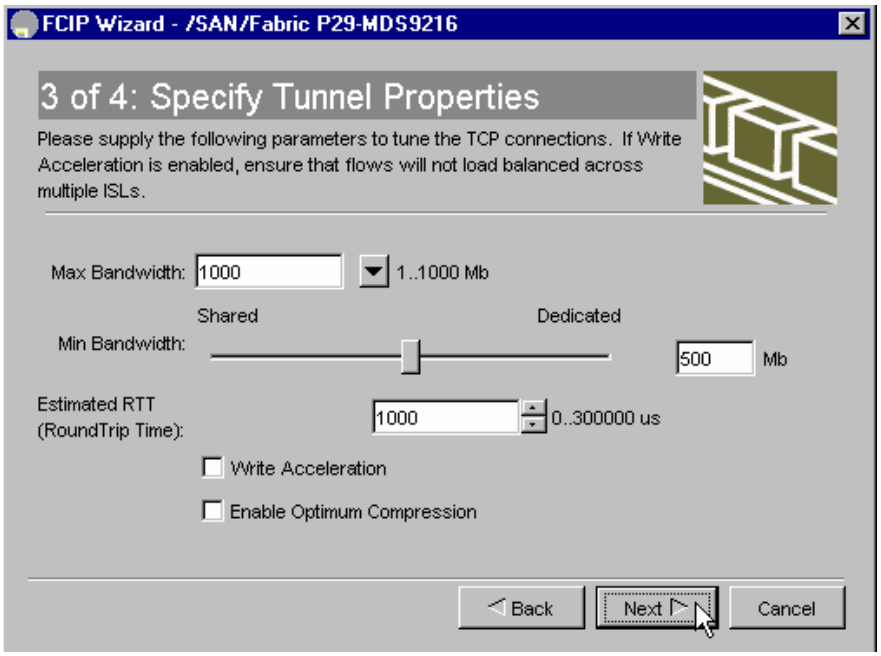
Step 5 In the **2 of 4: Select Ethernet Ports** screen, select **gigE2/2** in both panes and clear the **Use Large MTU Size (Jumbo Frames)** box.



Step 6 Click **Next**

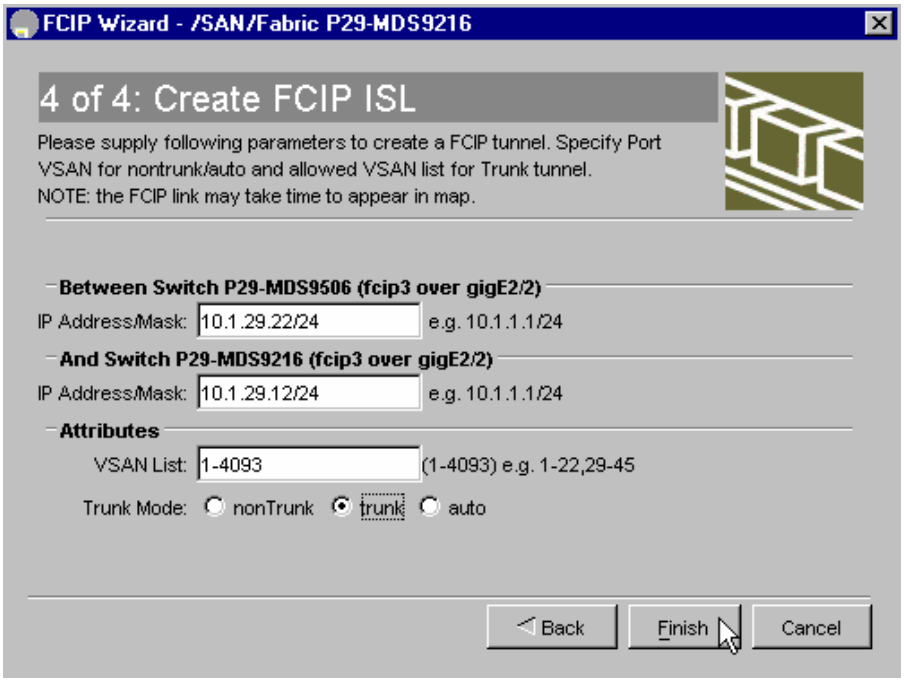
Caution Be sure **Large MTU Size** is NOT selected before continuing. The Ethernet switches in your pod do not support Jumbo Frames

Step 7 In the **3 of 4: Specify Tunnel Properties** screen, leave all parameters with the default values and click **Next**.



Step 8 In the **4 of 4: Create FCIP ISL** screen, configure the following settings:

- Enter the IP Address/Mask of the gigabit Ethernet interface for each switch in the appropriate field:
  - MDS 9506 = **10.1.*x*.22/24** (where *x* is your pod number)
  - MDS 9216 = **10.1.x.12/24** (where x is your pod number)
- Set the **Trunk Mode** option to **trunk** to enable trunk mode on (TE_Port)
- Click **Finish**.



Step 9 From the CLI, both teams verify the FCIP configuration:

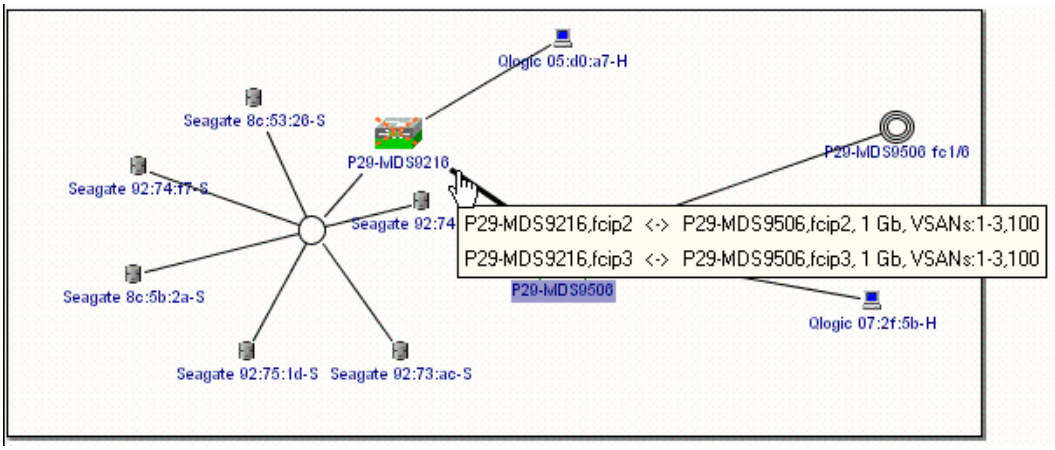
```
# show fcip profile
-------------------------------------------
ProfileId       Ipaddr          TcpPort
-------------------------------------------
1               10.1.29.21      3225
2               10.1.29.22      3225
```

You should see two profiles.

Step 10 Verify that both FCIP interfaces are active:

```
# show interface fcip2-3 brief
--------------------------------------------------------------------------------
Interface Vsan Admin Admin Status  Oper Profile
Eth Int Port-channel
               Mode  Trunk         Mode
                     Mode
--------------------------------------------------------------------------------
fcip2     1    auto  on   trunking  TE    1
GigabitEthernet2/1   --
fcip3     1    auto  on   trunking  TE    2
GigabitEthernet2/2   --
```

Step 11 From Fabric Manager, verify the FCIP links in the fabric map. Hold your cursor over the line between the two switches.



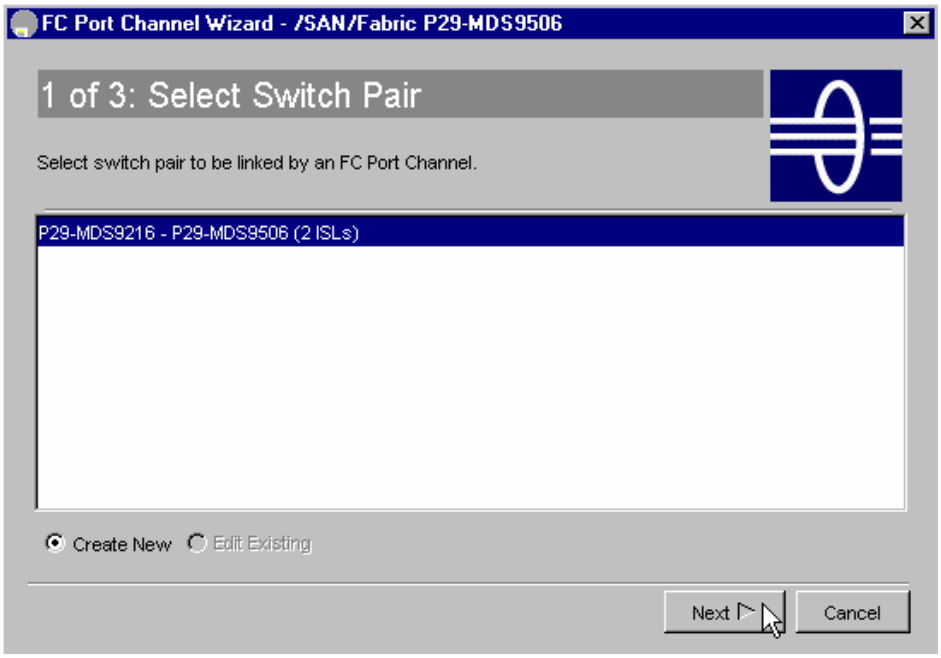
Activity Procedure 2: Create a PortChannel

Team 1 should perform this procedure on Server 1.

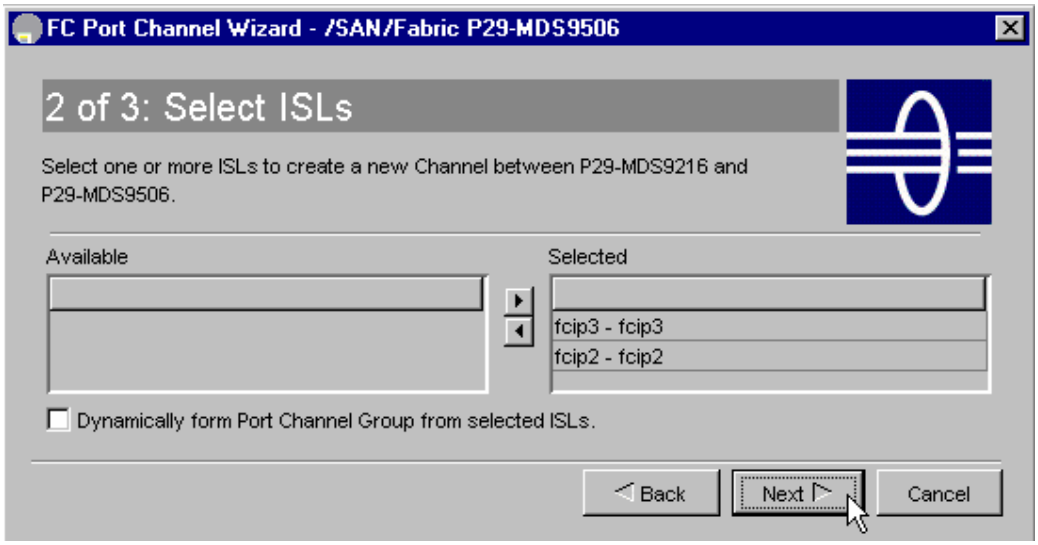
Step 1 Open Fabric Manager from the Windows desktop and connect to the MDS 9506.

Step 2 From the Fabric Manager tool bar, click the **Port Channel** icon.

Step 3 In the **1 of 3: Select Switch Pair** screen, select the pair showing both MDS switches and click **Next** to continue.



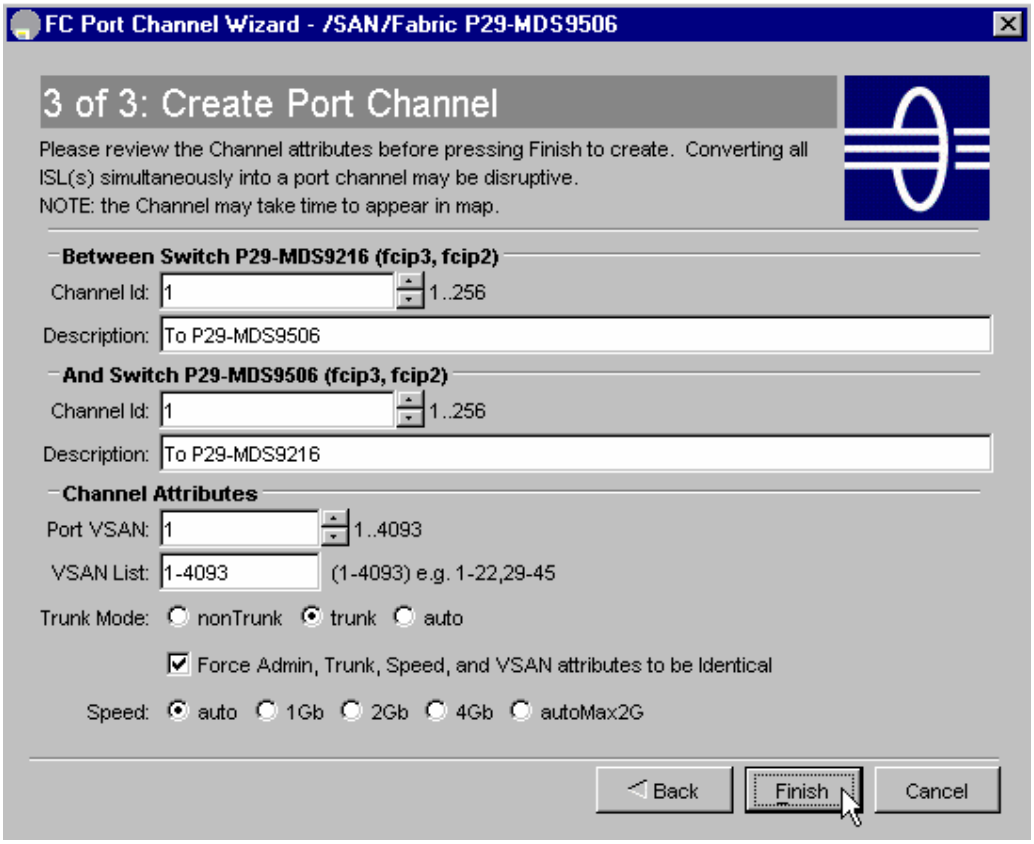
Step 4 In the **2 of 3: Select ISLs** screen, verify both FCIP interface pairs are in the **Selected** pane. Click **Next** to continue.



Caution Be sure to clear Dynamically form Port Channel Group from selected ISLs if checked.

Step 5 In the **3 of 3: Create Port Channel** screen, configure the following settings:

- In the **VSAN List** use the default value (1-4093)
- Set the **Trunk Mode** option to **trunk** to enable trunk mode on (TE_Port).



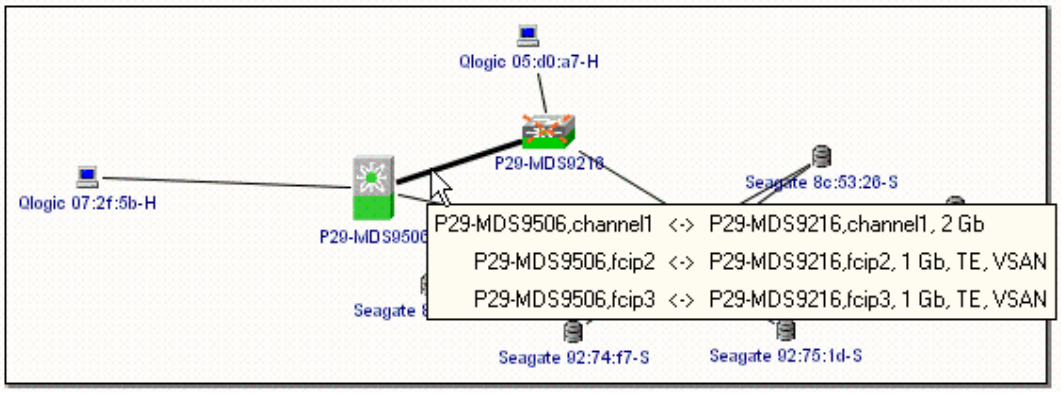
Step 5 Click **Finish**.

Step 6 A FC Port Channel Wizard warning dialog box appears, requesting confirmation to continue. Click **Yes** to create the PortChannel.

Step 7 Display the Port Channel database information.

```
# show port-chan database
port-channel 1
   Administrative channel mode is active
   Operational channel mode is active
   Last membership update succeeded
   First operational port is fcip2
   2 ports in total, 2 ports up
   Ports:   fcip2    [up] *
            fcip3    [up]
```

Step 8 In Fabric Manager, verify the Port Channel in the fabric map. Hold your cursor over the line between the two switches.



Task 4 Answer Key

When you complete this activity, your switch running-configuration file will be similar to the following, with differences that are specific to your device or workgroup. The following is a partial output of the **show run** command from P29-MDS9506 after completing this lab activity:

```
vsan database
vsan 2
vsan 3
vsan 100
fcip enable
fcip profile 1
ip address 10.1.29.21
fcip profile 2
ip address 10.1.29.22
iscsi enable
iscsi interface vsan-membership
islb distribute
interface port-channel 1
switchport description To P29-MDS9216
switchport mode E
channel mode active
interface fcip2
switchport mode E
channel-group 1 force
use-profile 1
peer-info ipaddr 10.1.29.11
write-accelerator
no shutdown
interface fcip3
switchport mode E
channel-group 1 force
use-profile 2
peer-info ipaddr 10.1.29.12
no shutdown
vsan database
vsan 3 interface fc1/5
vsan 2 interface fc1/6
switchname P29-MDS9506
san-ext-tuner enable
zone default-zone permit vsan 100
zone name ISCSI-Zone1 vsan 2
member pwwn 22:00:00:04:cf:8c:53:26
member pwwn 20:0e:00:0d:65:6a:17:c2
zoneset name ZoneSet1 vsan 2
```

```
member ISCSI-Zone1
zoneset activate name ZoneSet1 vsan 2
zoneset activate name ZoneSet1 vsan 3
interface fc1/5
no shutdown
interface fc1/6
no shutdown
interface GigabitEthernet2/1
ip address 10.1.29.21 255.255.255.0
no shutdown
interface GigabitEthernet2/2
ip address 10.1.29.22 255.255.255.0
no shutdown
interface iscsi2/2
no shutdown
```

Task 5: Configuring iSCSI and iSCSI Server Load Balancing

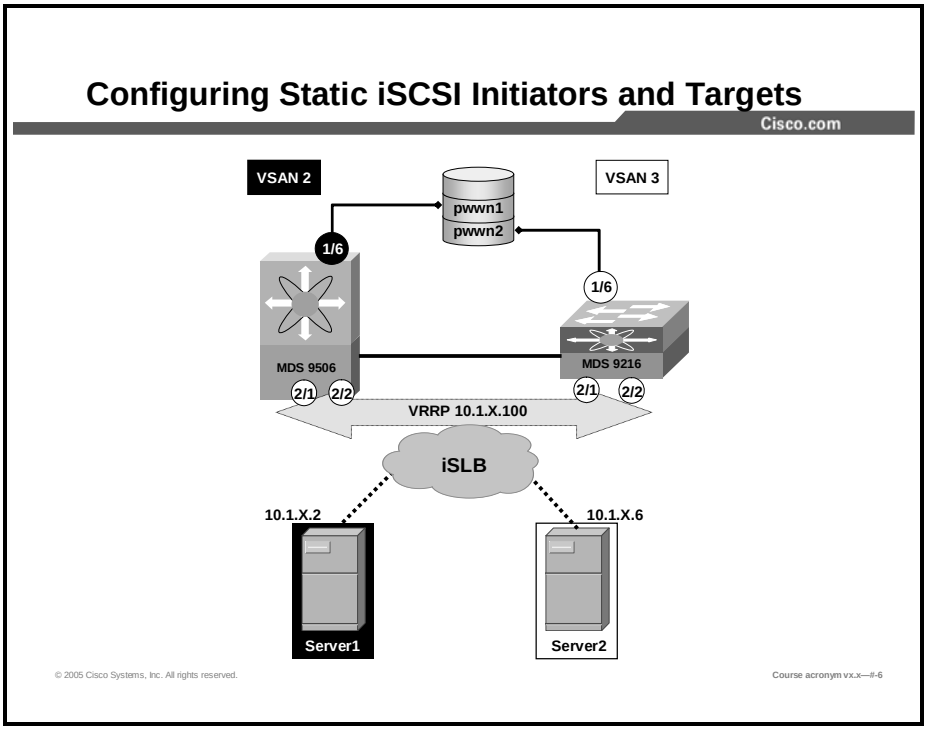
In this exercise, you will first configure and zone iSCSI initiators and targets using the Cisco Fabric Manager Wizard. You will then configure iSLB initiators, auto-zoned target entries and load balancing for iSLB initiators using VRRP.

After completing this exercise, you will be able to meet these objectives:

- Create and zone iSCSI initiators and targets.
- Configure iSLB initiators and auto-zoned targets.
- Configure VRRP for load balancing with iSLB.

Visual Objective

The figure illustrates what you will accomplish in this activity.



Command List

The commands used in this exercise are described in the table here.

Command	Description
iscsi enable	Enables iSCSI feature on an MDS switch
sh iscsi virtual-target	Lists all the active iSCSI virtual-targets
sh iscsi initiator	Displays iSCSI information for the initiators
sh iscsi session	Lists all the active iSCSI initiator or target sessions

Activity Procedure 1: Creating Static iSCSI Initiators

In this task you will enable the iSCSI feature and create static iSCSI initiators (the Windows 2000 Servers) specifying the workstation's IP address.

Note Complete these steps on both the **MDS 9506 and MDS 9216**

Step 1 From the CLI, enable the iSCSI feature and iSCSI interfaces:

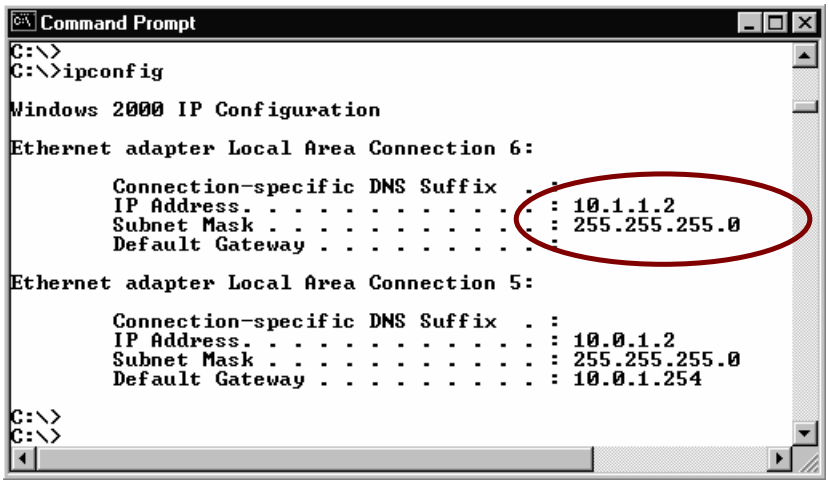
```
# conf t
(config)# iscsi enable
(config)# interface iscsi 2/1-2
(config-if)# no shut
(config-if)# end
```

Step 2 Verify your results:

```
# show interface iscsi 2/1-2 brief
--------------------------------------------------
----
Interface      Status      Oper Mode         Oper
Speed
                                                (Gbps)
--------------------------------------------------
----
iscsi2/1        up           ISCSI             1
iscsi2/2        up           ISCSI             1
```

Step 3 From your Windows 2000 server, get the server IP address by opening a Command Prompt window and running the **ipconfig** command. Record the server address in the space provided below:

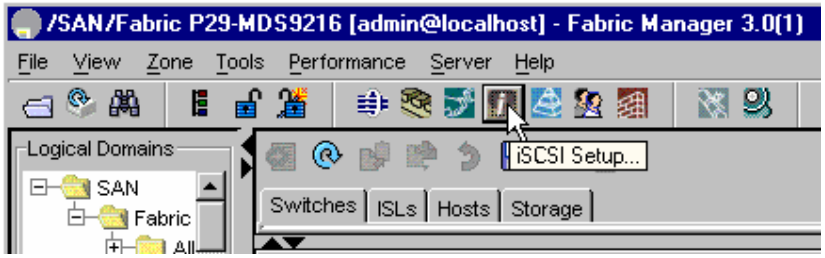
Record your IP address: **10.1.**_____.**.**_____



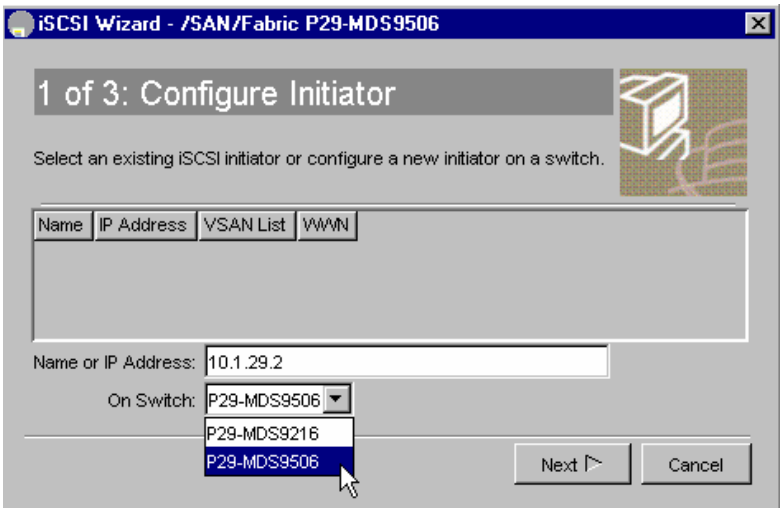
Note You will see two IP addresses in the report. Record the **10.1.x.y** subnet address. You will use the server's IP address to configure the iSCSI initiator.

Step 4 Open Fabric Manager and log in to your assigned switch with the username **admin** and the password **1234qwer**.

Step 5 Launch the iSCSI Wizard.



Step 6 Enter the **IP address** of the server that you recorded in **Step 3**.

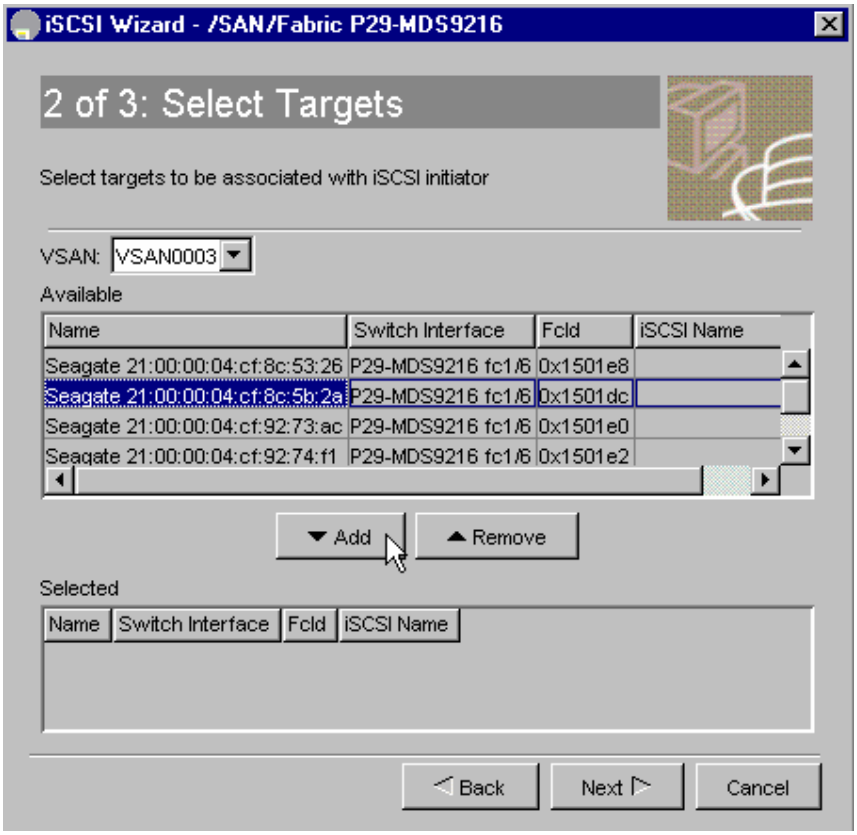


Step 7 Select the appropriate switch from the **On Switch**: pull-down menu (**Server 1 = MDS9506 , Server 2 = MDS9216**)

Step 8 Click **Next.**

Step 9 In the **Select Targets** dialog, specify the following information:

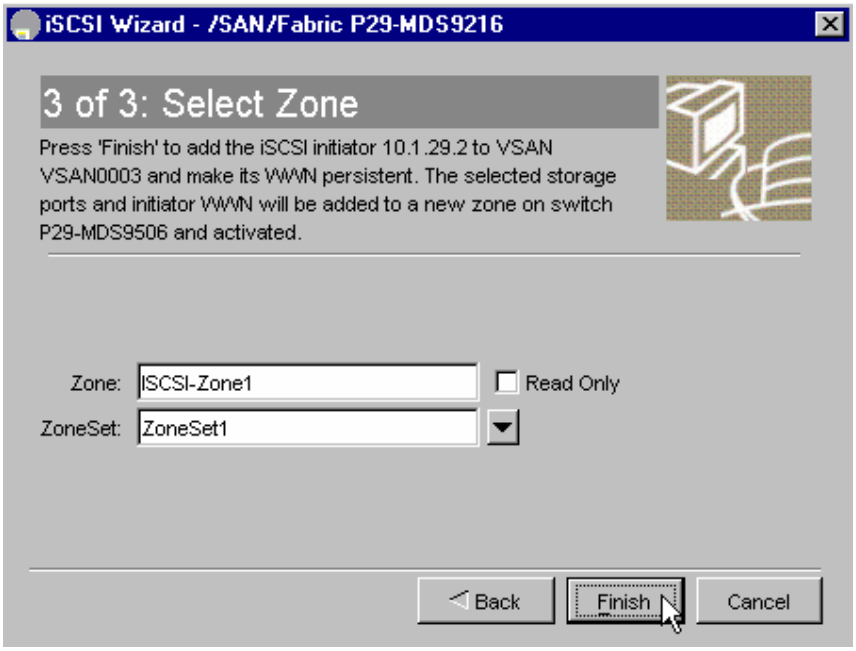
- **VSAN**: [9506 = VSAN 2; 9216 = VSAN 3]
- Select a disk target:
  - **9506 Select the first Seagate disk**
  - **9216 Select the second Seagate disk**



Step 10 Click **Add**.

Step 11 Click **Next**.

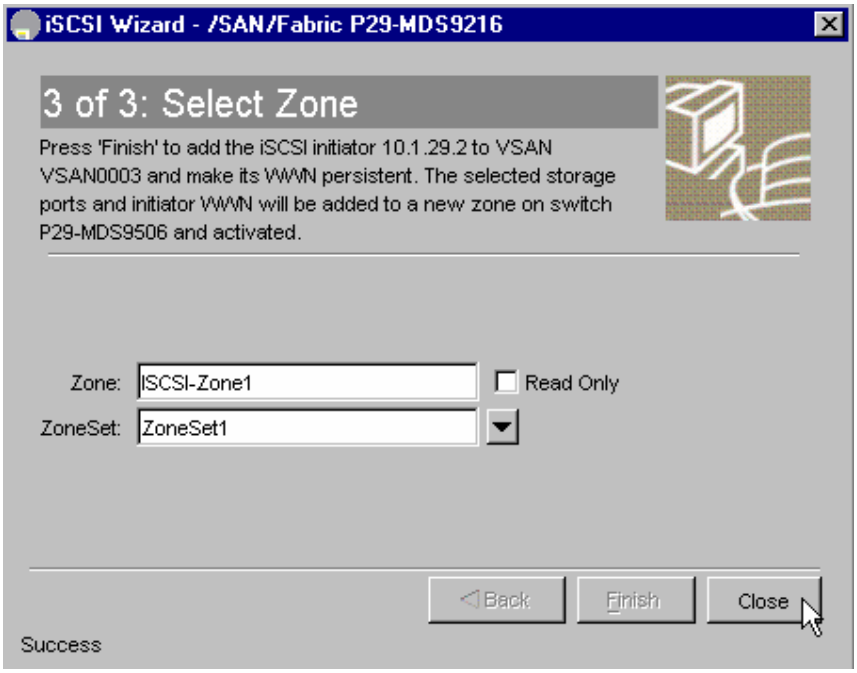
Step 12 Accept the default Zone and Zoneset names.



Step 13 Click **Finish**

Step 14 Select **Continue Activation** to Save the Running to Startup configuration

Step 15 Click close to close the **iSCSI Wizard**.

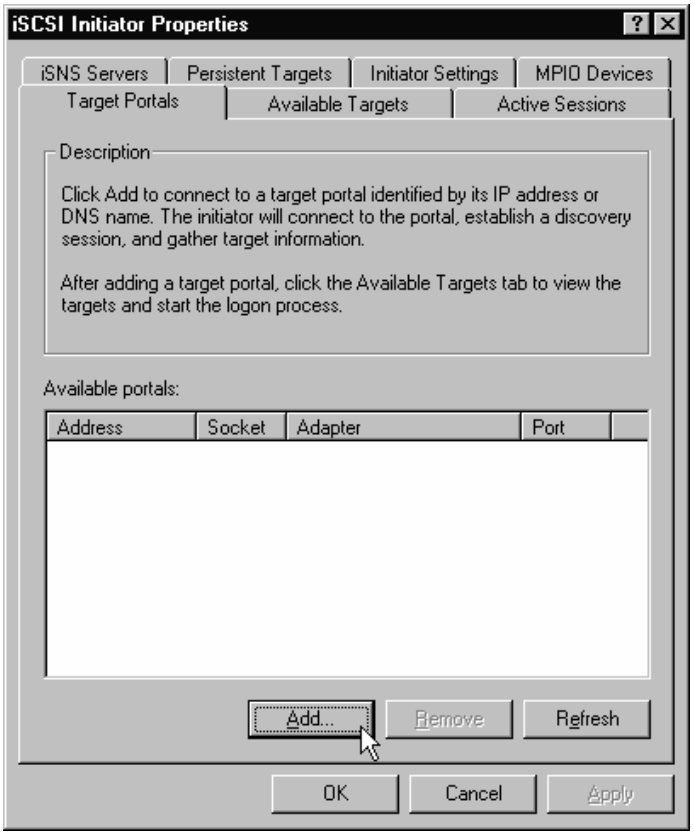


Step 16 From the CLI, verify the results:

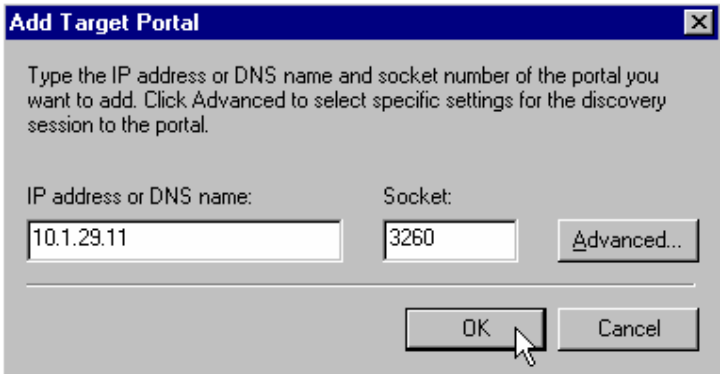
```
# show iscsi initiator configured
iSCSI Node name is 10.1.29.2
Member of vsans: 3
Node WWN is 24:02:00:0b:fd:d0:68:82
No. of PWWN: 1
Port WWN is 24:01:00:0b:fd:d0:68:82
Configured node (iSCSI)
```

Step 17 From the Windows Server desktop, launch the Microsoft iSCSI Initiator:

Step 18 Choose the **Target Portals** tab and select **Add**.

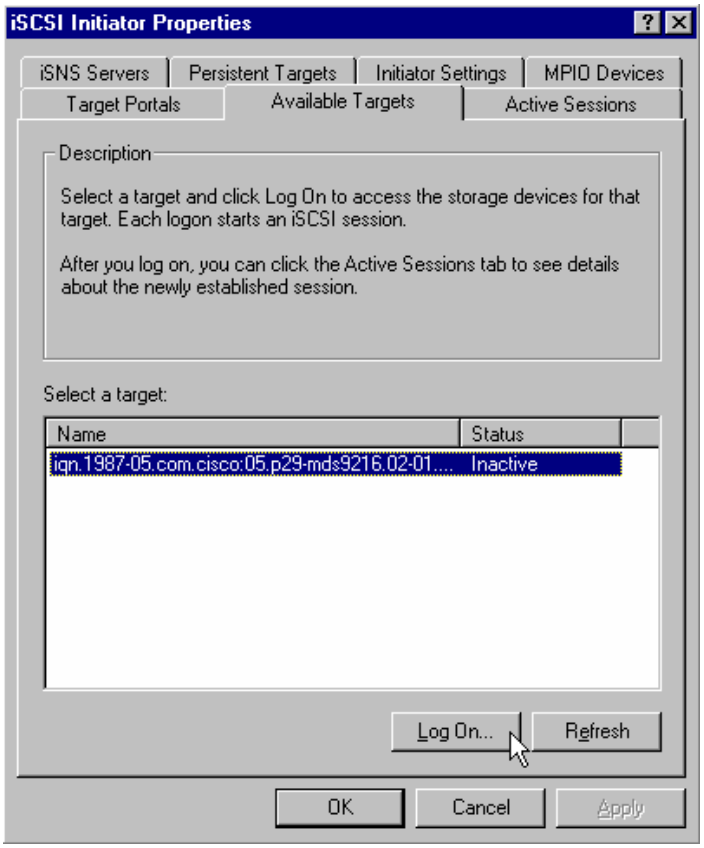


Step 19 Enter the IP address for the interface gigabit Ethernet 2/1. Click **OK**.



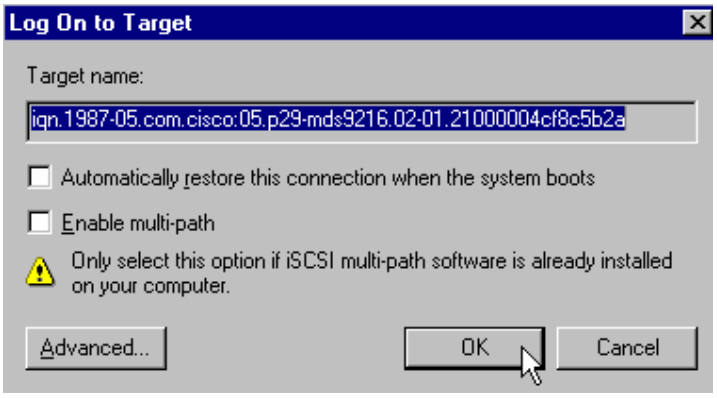
Note Server 1 = 10.1.x.21; Server 2 = 10.1.x.11 (where *X* is your Pod number)

Step 20 Choose the **Available Targets** tab.

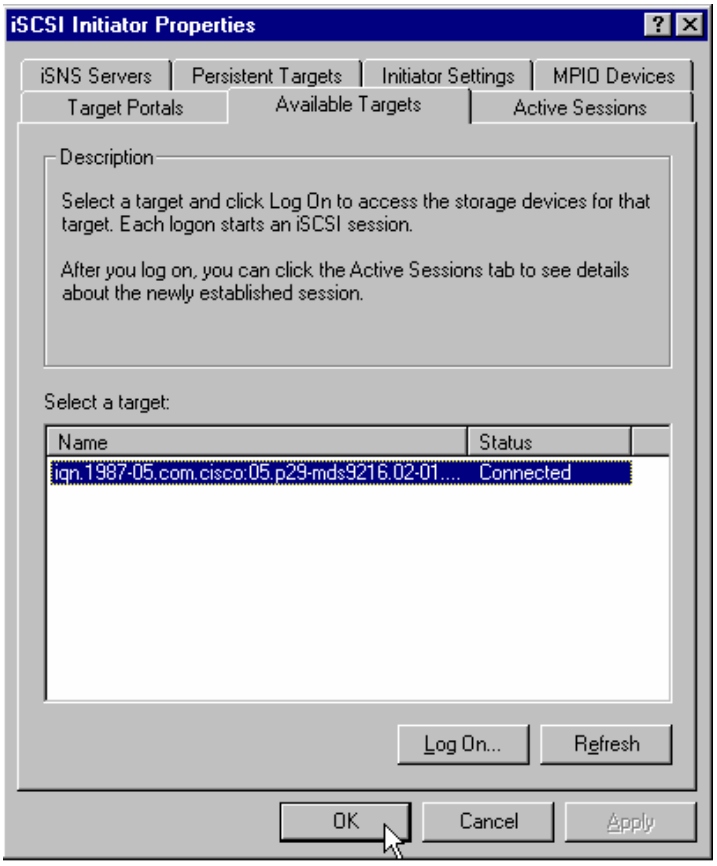


Step 21 Click **Log On**.

Step 22 Select OK to Log On to Target



Step 23 The status should reflect Connected.



Step 24 Click OK to close the iSCSI Initiator Properties

Step 25 From the CLI, display the iSCSI initiator:

```
# show iSCSI initiator

iSCSI Node name is 10.1.29.2

iSCSI Initiator name: iqn.1991-
05.com.microsoft:p29-server1

iSCSI alias name:

Configured node (iSCSI)

Node WWN is 24:02:00:0b:fd:d0:68:82 (configured)

Member of vsans: 3

Number of Virtual n_ports: 1

Virtual Port WWN is 24:01:00:0b:fd:d0:68:82
(configured)

Interface iSCSI 2/1, Portal group tag: 0x3080

VSAN ID 3, FCID 0x150001
```

Step 26 From the CLI, display the iSCSI target

```
# show iscsi virtual-target
target: iqn.1987-05.com.cisco:05.p29-mds9216.02-
01.21000004cf8c5b2a
* Port WWN 21:00:00:04:cf:8c:5b:2a , VSAN 3
Auto-created node (iSCSI)
```

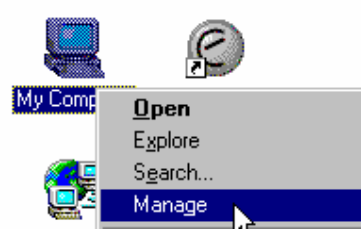
Step 27 From the CLI, display the active zoneset

```
# show zoneset active
zoneset name ZoneSet1 vsan 2
zone name ISCSI-Zone1 vsan 2
* fcid 0x1001e8 [pwwn 22:00:00:04:cf:8c:53:26]
* fcid 0x100001 [pwwn 20:0e:00:0d:65:6a:17:c2]
zoneset name ZoneSet1 vsan 3
zone name ISCSI-Zone1 vsan 3
* fcid 0x1501dc [pwwn 21:00:00:04:cf:8c:5b:2a]
* fcid 0x150001 [pwwn 24:01:00:0b:fd:d0:68:82]]
```

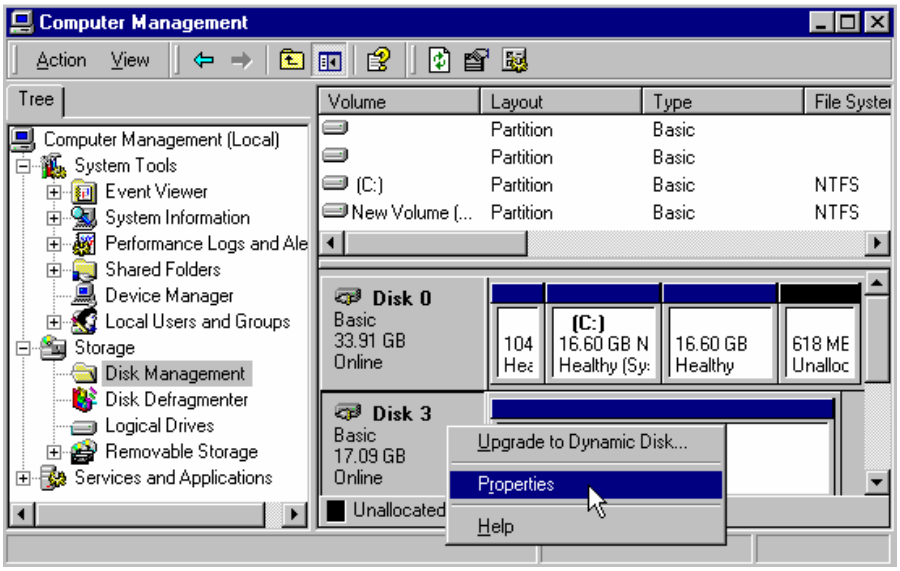
Step 28 From the CLI, display the active iSCSI session.

```
# show iscsi session
Initiator 10.1.29.2
Initiator name iqn.1991-05.com.microsoft:p29-server1
Session #1
Target iqn.1987-05.com.cisco:05.p29-mds9216.02-01.21000004cf8c5b2a
VSAN 3, ISID 400001370000, Status active, no reservation
```

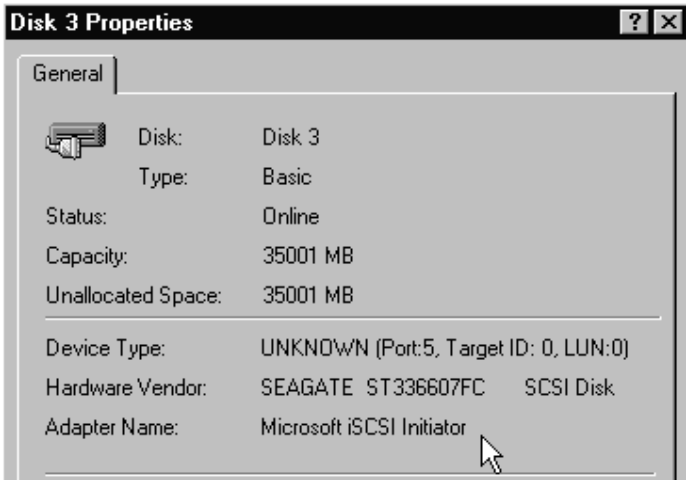
Step 29 On your W2K Server desktop, right-click **My Computer** and select **Manage**



Step 30 In the Computer Management window, **select Storage | Disk Management**. In the lower right panel of Disk Manager, you will see the disk drives. Scroll down and right-click your disk, select **Properties**. (Be sure to right-click the box that says "Disk N", not the volume area to the right)



Step 31 The disk should have an **Adapter Name** of **Microsoft iSCSI Initiator**.



If the Adapter name is not the Microsoft iSCSI initiator, try another disk until you find the iSCSI-attached disks.

Step 32 Identify the iSCSI-attached disk. Write its number here: _____

Step 33 Click **Cancel** to close the Properties dialog.

Activity Procedure 2: Configure iSCSI Server Load Balancing (iSLB)

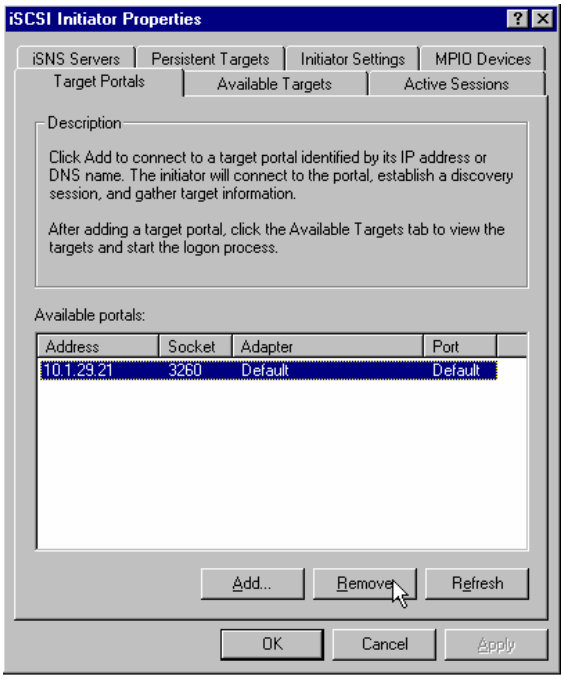
Both teams complete these steps on your respective servers and switches.

Note	Team 1 = MDS9506 and W2k Server 1, Team 2 = MDS 9216 and W2K Server 2.

Step 1 On your W2K Server desktop, launch the **Microsoft iSCSI Initiator**.

Step 2 Select the **Active Sessions** tab and click **Log Off.**

Step 3 Select the **Target Portals** tab and click **Remove**

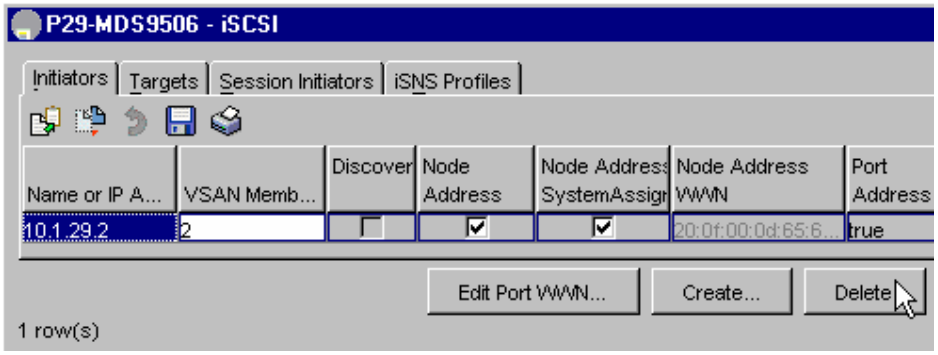


Step 4 Click **OK** to close the Microsoft iSCSI Initiator

Step 5 Launch **Device Manager** and login with the username **admin** and the password **1234qwer**

Step 6 Select **IP > iSCSI**

Step 7 Select the initiator and click **Delete.**



Step 8 Answer **Yes** to confirm the deletion

Step 9 Click **Close** to close the iSCSI configuration window.

Step 10 Return to the **CLI** for your switch to create the VRRP group that will be used for iSLB load-balancing.

Step 11 Configure the **VRRP group 200** for both GigE interfaces on both switches with the IP address **10.1.x.100 (where x = your pod number)**

```
# config
 (config)# interface gigabitethernet 2/1
 (config-if)# vrrp 200
 (config-if-vrrp)# address 10.1.x.100
 (config-if-vrrp)# no shut
 (config-if-vrrp)# interface gigabitethernet 2/2
 (config-if)# vrrp 200
 (config-if-vrrp)# address 10.1.x.100
 (config-if-vrrp)# no shut
 (config-if-vrrp)# end
```

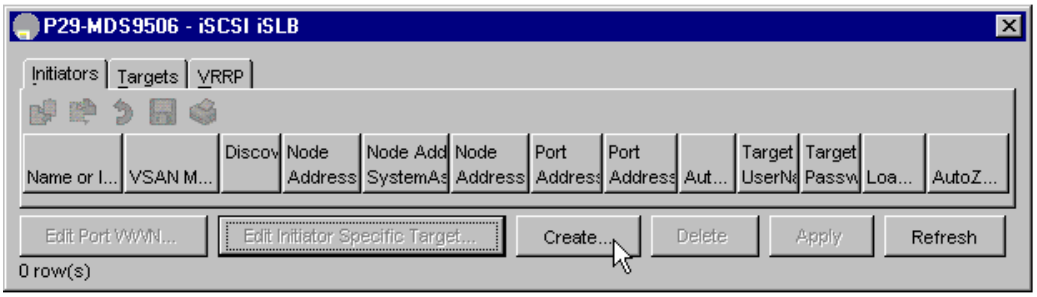
Step 12 Confirm the creation of the VRRP group 200 on each switch.

```
# show vrrp
Interface  VR IpVersion Pri   Time Pre State   VR
IP addr
------------------------------------------------------
------------------------
GigE2/1 200   IPv4    100    1 s     backup
10.1.29.100
GigE2/2 200   IPv4    100    1 s     master
10.1.29.100
# show vrrp
Interface  VR IpVersion Pri   Time Pre State   VR
IP addr
------------------------------------------------------
------------------------
GigE2/1 200   IPv4    100    1 s     backup
10.1.29.100
GigE2/2 200   IPv4    100    1 s     backup
10.1.29.100
```

Step 13 Return to your W2K Server desktop

Step 14 From Device Manager select **IP > iSCSI iSLB.**

Step 15 Click **Create** on the iSCSI iSLB initiators tab.



Step 16 Configure the iSCSI iSLB initiator as follows:

IP Address:

- MDS 9506, W2K Server 1 = **10.1.x.2** (where x = your pod number)
- MDS 9216, W2K Server 2 = **10.1.x.6** (where x = your pod number)

VSAN Membership:

- MDS 9506, W2K Server 1 = **2**
- MDS 9216, W2K Server 2 = **3**

Node WWN Mapping

- Check the boxes for both Persistent and SystemAssigned

Port WWN Mapping

- Check the boxes for both Persistent and System Assigned

Initiator Specific Target

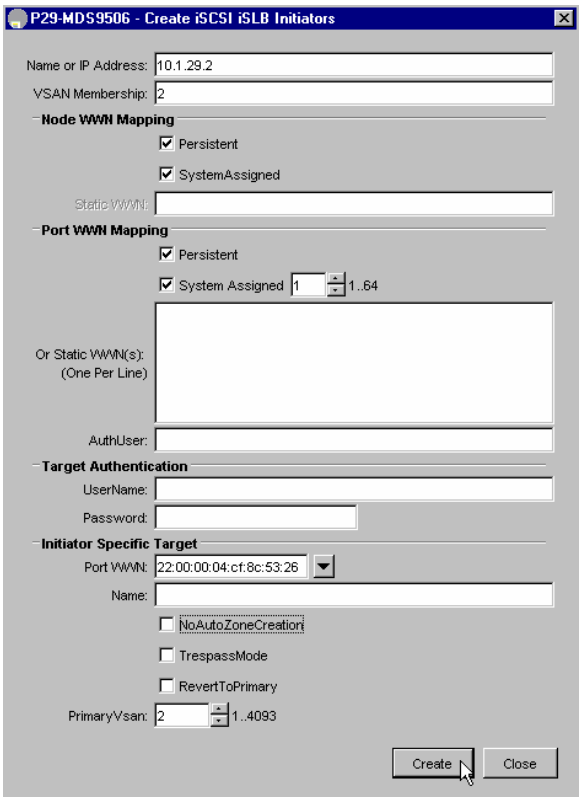
- MDS 9506, W2K Server 1

  Select the **first** Seagate WWN that begins with **22:00:00**
- MDS 9216, W2K Server 2 = **3**

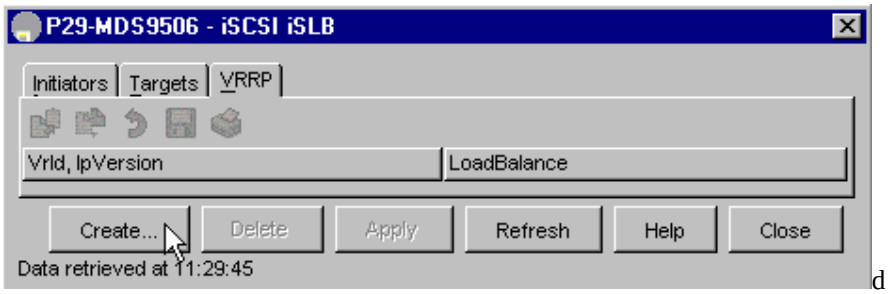
  Select the **second** Seagate WWN that begins with **21**:**00:00**

Primary VSAN

- MDS 9506, W2K Server 1 = **2**
- MDS 9216, W2K Server 2 = **3**

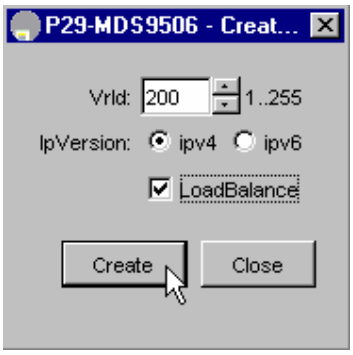


Step 17 Click **Create**
Step 18 Click **Close**
Step 19 Select the iSCSI iSLB **VRRP** tab



d

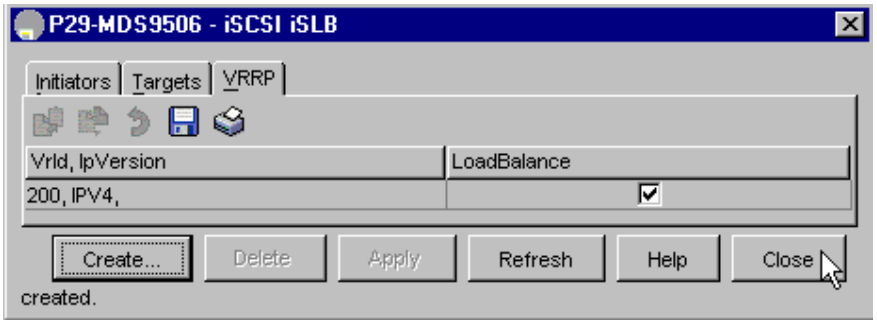
Step 20 Click **Create.**



Step 21 **Enter** the Virtual Router ID **200** for the VRRP group you created in **Step 11**

Step 22 Select the **LoadBalance** check box

Step 23 Click **Create** and **Close.**



Step 24 Click **Close** to close the iSCSI iSLB menu.

Step 25 Return to the **CLI** for your switch.

Step 26 Check the CFS distribution status for the iSLB application

```
# show cfs application name islb
Enabled        : No
Timeout        : 60s
Merge Capable  : Yes
Scope          : Physical-fc
```

Step 27 Enable CFS distribution for iSLB

```
# config
 (config)# islb distribute
```

Step 28 Commit the CFS iSLB distribution

```
(config)# islb commit
(config)# end
```

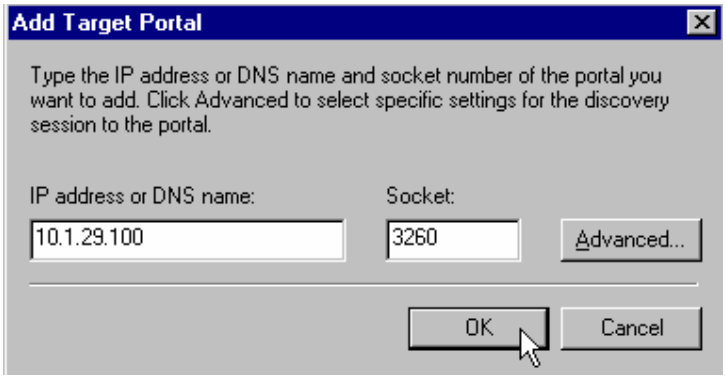
Step 29 Show the iSLB merge status

```
# show islb merge status
Merge Status: SUCCESS
```

Step 30 On your W2K Server desktop, launch the **Microsoft iSCSI Initiator**.

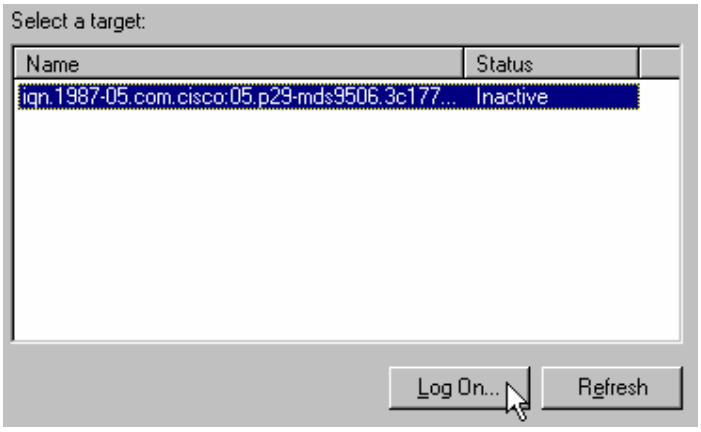
Step 31 On the **Target Portals** tab click **Add.**

Step 32 Enter the IP address of the VRRP group 200 **10.1.x.100** (where x = your pod number) in the **IP address** field of the Add **Target Portal dialogue.**

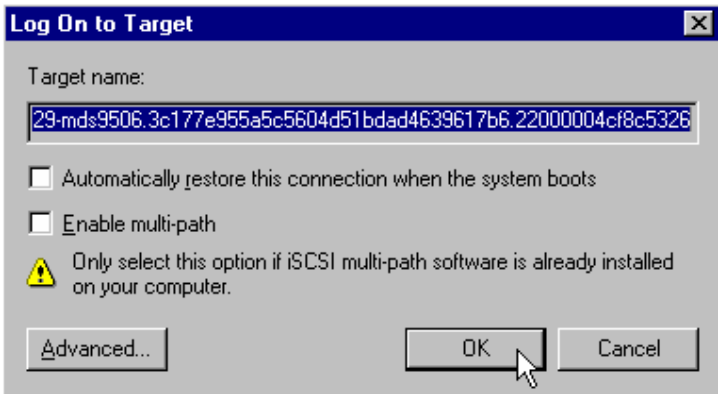


Step 33 Click **OK**

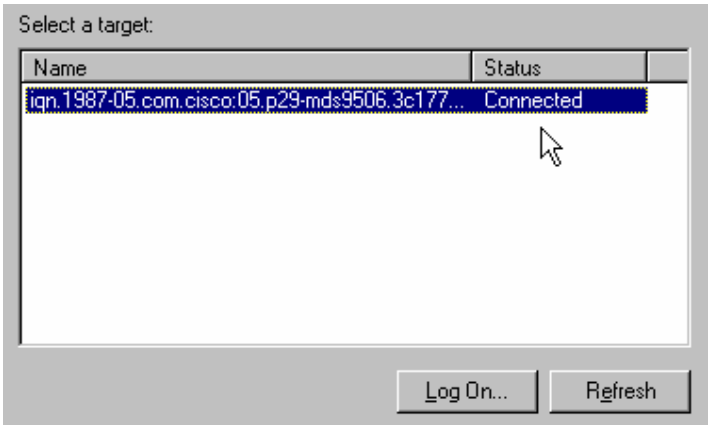
Step 34 Select the **Available Targets** tab and click **Log On.**



Step 35 Click **OK** on the **Log On to Target** dialogue



Step 36 Confirm that the iSCSI target status reads **Connected** in the **Available Targets** tab**.**



Step 37 Return to the CLI for your switch.

Step 38 View the active zoneset to confirm the auto-zoned iSLB initiator and target entries in **ips_zone_**

```
# show zoneset active
zoneset name ZoneSet1 vsan 2
zone name ISCSI-Zone1 vsan 2
* fcid 0x1001e8 [pwwn 22:00:00:04:cf:8c:53:26]
* fcid 0x140001 [pwwn 20:0e:00:0d:65:6a:17:c2]
zone name ips_zone_3c177e955a5c5604d51bdad4639617b6
vsan 2
* fcid 0x140001 [ip-address 10.1.29.2]
* fcid 0x1001e8 [pwwn 22:00:00:04:cf:8c:53:26]
zoneset name ZoneSet1 vsan 3
zone name ISCSI-Zone1 vsan 3
* fcid 0x1501dc [pwwn 21:00:00:04:cf:8c:5b:2a]
* fcid 0x150001 [pwwn 24:01:00:0b:fd:d0:68:82]
zone name ips_zone_ef4a4134ab6e40b56d22582d989b24ec
vsan 3
* fcid 0x150001 [ip-address 10.1.29.6]
* fcid 0x1501dc [pwwn 21:00:00:04:cf:8c:5b:2a]
```

Step 39 View the iSLB group and interface load balance information

```
# show islb vrrp summary
              -- Groups For Load Balance --
--------------------------------------------------
VR Id             VRRP Address Type
Configured Status
--------------------------------------------------
200                          IPv4
Enabled
              -- Interfaces For Load Balance --
--------------------------------------------------
Initiator  Redirect
VR Id         VRRP IP              Switch WWN
Interface      Load   Enabled
--------------------------------------------------
200     10.1.29.100 20:00:00:0b:fd:d0:68:80
GigE2/1      1000       Yes
  200     10.1.29.100 20:00:00:0b:fd:d0:68:80
GigE2/2      1000       Yes
  200     10.1.29.100 20:00:00:0d:65:6a:17:c0
GigE2/1         0       Yes
M 200     10.1.29.100 20:00:00:0d:65:6a:17:c0
GigE2/2         0       Yes
-- Initiator To Interface Assignment --
```

```
-----------------------------------------------------
Initiator  VR Id     VRRP IP      Switch WWN
Interfac
-----------------------------------------------------
10.1.29.2  200     10.1.29.100
20:00:00:0b:fd:d0:68:80     GigabitEthernet2/2
10.1.29.6  200     10.1.29.100
20:00:00:0b:fd:d0:68:80     GigabitEthernet2/1
```

Step 40 View the current iSLB initiator VRRP assignments

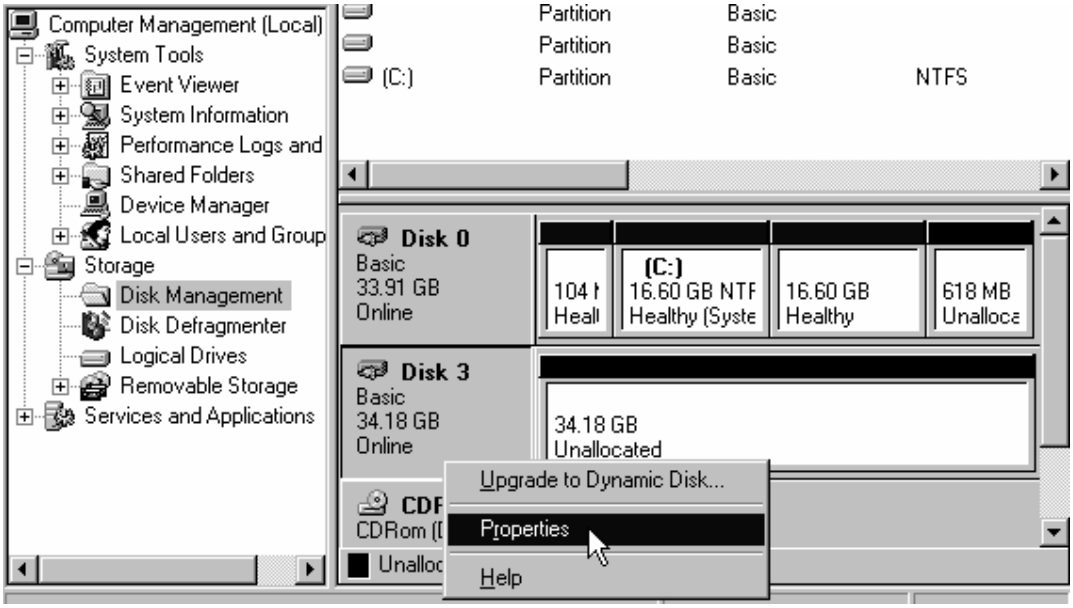
```
# show islb vrrp assignment
-- Initiator To Interface Assignment --
Initiator 10.1.29.2
VRRP group id: 200, VRRP IP address: 10.1.29.100
Assigned to switch wwn: 20:00:00:0b:fd:d0:68:80
ifindex: GigabitEthernet2/2
Waiting for the redirected session request: False
Initiator weighted load: 1000
Initiator 10.1.29.6
VRRP group id: 200, VRRP IP address: 10.1.29.100
Assigned to switch wwn: 20:00:00:0b:fd:d0:68:80
ifindex: GigabitEthernet2/1
Waiting for the redirected session request: False
Initiator weighted load: 1000
```

Activity Procedure 3: Partition and Format the iSCSI Disk

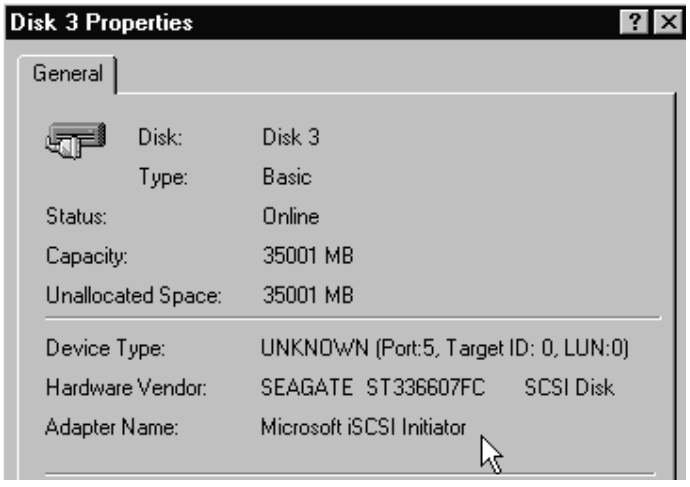
Both teams complete these steps on your respective server:

Step 1 On your W2K Server desktop, right-click **My Computer** and select **Manage**.

Step 2 In the Computer Management window, select **Storage | Disk Management**. In the lower right panel of Disk Manager, you will see the disk drives. Scroll down and right-click your disk, select **Properties**. (Be sure to right-click the box that says "Disk *N*", not the volume area to the right)



Step 3 The disk should have an **Adapter Name** of **Microsoft iSCSI Initiator**.

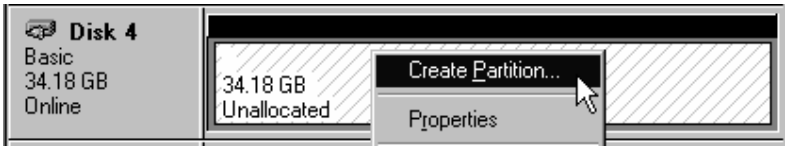


If the Adapter name is not the Microsoft iSCSI initiator, try another disk until you find the iSCSI-attached disks.

Step 4 Identify the iSCSI-attached disk. Write its number here: _____

Step 5 Click **Cancel** to close the Properties dialog.

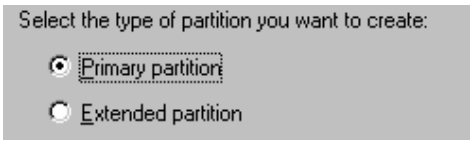
Step 6 Follow the procedure to create a partition. Right-click on the Unallocated space and select **Create Partition**.



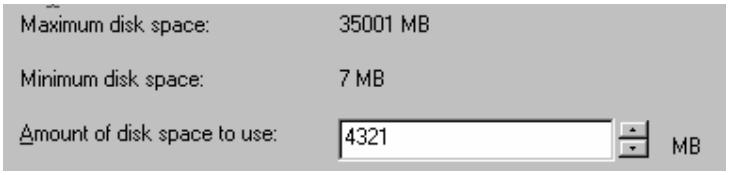
Note	If a partition already exists, delete it and recreate another partition

Step 7 The **Create Partition Wizard** will begin. Click **Next**.

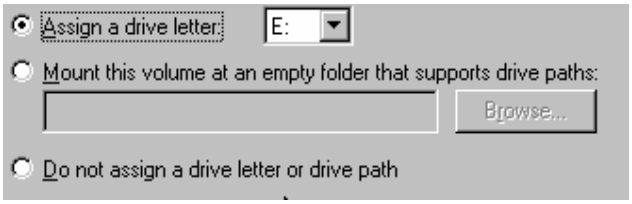
Step 8 Select Primary Partition and click Next.



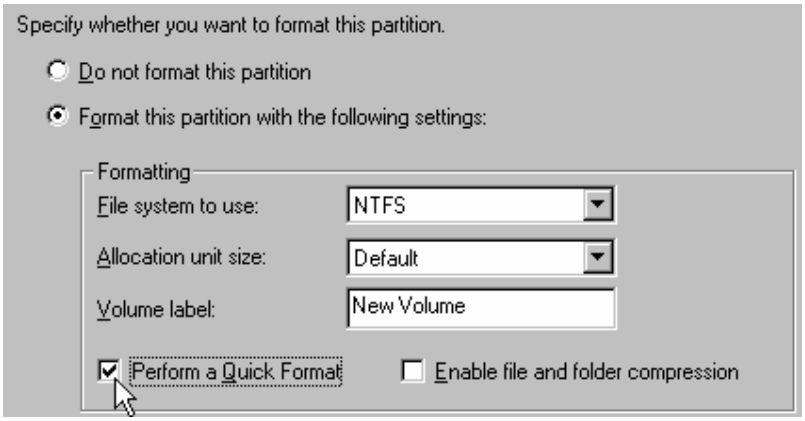
Step 9 Configure a partition size of 4321 MB and click **Next**.



Step 10 Assign a drive letter **E:** and click **Next**.

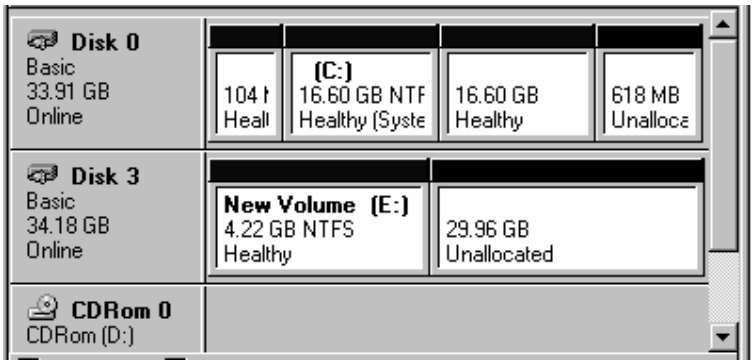


Step 11 Check **Perform a Quick Format**, and click **Next**



Step 12 Review your configuration and click **Finish**.

Step 13 Disk Manager will show that the volume is formatting. This will take a few seconds. When the formatting is done, the **New Volume** will be marked **Healthy**.



Activity Verification

Complete these steps to test your new volumes:

Step 1 Close all open applications and log out. (You do not need to reboot, just log out.)

Step 2 When the PC desktop window closes, return to the LabGear window, access your PC's remote desktop, and log in as **administrator** with password **cisco**.

Step 3 On the Windows desktop, right-click **My Computer** and choose **Explore.**

Step 4 Verify the drive **New Volume (E:)** is visible.

Step 5 Copy a folder from the C: drive to **New Volume(E:)**.

You have completed this lab successfully if you can create and copy files to the iSCSI-attached volume.

Task 5 Answer Key

When you complete this activity, your switch running-configuration file will be similar to the following, with differences that are specific to your device or workgroup. The following is a partial output of the **show run** command from P29-MDS9506 after completing this lab activity:

```
vsan database
vsan 2
vsan 3
vsan 100
fcip enable
fcip profile 1
ip address 10.1.29.21
fcip profile 2
ip address 10.1.29.22
iscsi enable
iscsi interface vsan-membership
islb distribute
interface port-channel 1
switchport description To P29-MDS9216
switchport mode E
channel mode active
interface fcip2
switchport mode E
channel-group 1 force
use-profile 1
peer-info ipaddr 10.1.29.11
write-accelerator
no shutdown
interface fcip3
switchport mode E
channel-group 1 force
use-profile 2
peer-info ipaddr 10.1.29.12
no shutdown
vsan database
vsan 3 interface fc1/5
vsan 2 interface fc1/6
switchname P29-MDS9506
iscsi import target fc
islb initiator ip-address 10.1.29.2
static nWWN 20:0f:00:0d:65:6a:17:c2
static pWWN 20:0e:00:0d:65:6a:17:c2
vsan 2
target pwwn 22:00:00:04:cf:8c:53:26 vsan 2
```

```
islb initiator ip-address 10.1.29.6
static nWWN 24:02:00:0b:fd:d0:68:82
static pWWN 24:01:00:0b:fd:d0:68:82
vsan 3
target pwwn 21:00:00:04:cf:8c:5b:2a vsan 3
islb vrrp 200 load-balance
islb commit
san-ext-tuner enable
zone default-zone permit vsan 100
zone name ISCSI-Zone1 vsan 2
member pwwn 22:00:00:04:cf:8c:53:26
member pwwn 20:0e:00:0d:65:6a:17:c2
zoneset name ZoneSet1 vsan 2
member ISCSI-Zone1
zoneset activate name ZoneSet1 vsan 2
zoneset activate name ZoneSet1 vsan 3
interface fc1/5
no shutdown
interface fc1/6
no shutdown
interface GigabitEthernet2/1
ip address 10.1.29.21 255.255.255.0
no shutdown
vrrp 200
address 10.1.29.100
no shutdown
interface GigabitEthernet2/2
ip address 10.1.29.22 255.255.255.0
no shutdown
vrrp 200
address 10.1.29.100
no shutdown
interface iscsi2/1
no shutdown
interface iscsi2/2
no shutdown
interface mgmt0
switchport speed 100
ip address 10.0.29.5 255.255.255.0
```